JOURNAL *of* EDUCATIONAL RESEARCH

VOLUME III JANUARY, 1921 NUMBER 1

SOME RECENT RESULTS OBTAINED FROM THE OTIS GROUP INTELLIGENCE SCALE

STEPHEN S. COLVIN
Brown University

During the school year of 1919–1920, the Otis Group Intelligence Scale, Forms A and B, was given by students and teachers under the writer's direction to 2,588 children and older pupils in various schools in Massachusetts and Rhode Island as is shown in the following table. In all cases, Form A of the tests was administered first, and after an interval of some days or weeks Form B was given under approximately identical conditions.

SCHOOLS	GRADES	PUPILS	EXAMINERS
Brookline, Mass.	IV–IX	1,877	Teachers
Miss Wheeler's Private School for Girls, Providence, R. I.	IV–XII	147	Teachers and G. R. Dolloff, graduate student, Brown University
Belmont (Mass.) Junior High School	VII–VIII	259	W. A. Nickerson, teacher at Belmont, graduate student, Boston University
Reading (Mass.) High School	IX	115	Mrs. B. H. Cahill, graduate student, Boston University
Bridgewater Normal School	N. S.	190	Brenelle Hunt, Bridgewater Normal School, graduate student, Boston University

The results of the tests are consistent throughout in showing that the Otis norms, even in their revised form, are much too low for the group of children tested.[1] They are also consistent in showing that a considerable practice-effect results from giving the tests, since in all instances the averages and medians for Form B are definitely higher than for Form A. The results further indicate that in a large majority of cases the tests are of considerable prognostic value in determining the scholastic attainments of the pupils examined. These results will be discussed in more detail.

[1] The Haggerty tests, given under the writer's direction to a small group of children in Providence schools, show in this respect similar results.

Although Otis has based his norms on the results of the examinations of many thousand school children, his standards are clearly of little value in determining the actual intelligence of those tested in the schools here reported. The results in the Brookline schools are typical and enlightening in this respect. Both the median scores by ages and the median scores by grades show figures decidedly higher than the Otis standards (see Table I). That this result is not a matter of chance is definitely indicated by median scores and I. Q.'s obtained in other schools.

TABLE I. BROOKLINE (MASS.) PUBLIC SCHOOLS. DISTRIBUTION OF SCORES OF 1,877 PUPILS IN OTIS INTELLIGENCE SCALE

A. BY AGES

Age	Number of Cases	Median Score	Highest Score	Lowest Score
7½	2	81	97	65
8	16	58	105	32
8½	60	70.5	124	27
9	86	67.5	115	14
9½	113	78.5	163	26
10	142	80.5	164	23
10½	146	90	172	16
11	138	94	161	21
11½	157	109	194	19
12	167	118	195	24
12½	153	119.5	192	21
13	164	130	193	32
13½	181	133	194	36
14	116	135.5	191	29
14½	98	134.5	203	49
15	97	136	193	19
16	35	124	173	69
17	6	110	152	72

B. BY GRADES (IV TO IX INCLUSIVE)

Grade	Number of Cases	Median Score	Highest Score	Lowest Score
IV	330	63.5	124	14
V	332	83	164	19
VI	360	103.5	172	21
VII	261	107	195	26
VIII	344	133	194	49
IX	250	148.5	203	77

TABLE II. BROOKLINE (MASS.) PUBLIC SCHOOLS. CORRELATIONS BETWEEN FORMS A AND B AND BETWEEN

TABLE II. BROOKLINE (MASS.) PUBLIC SCHOOLS. CORRELATIONS BETWEEN FORMS A AND B AND BETWEEN INTELLIGENCE AND SCHOLARSHIP

School	Grade	Correlation between Forms A and B (r values)	Correlation between Intelligence and Scholarship (r values)
Runkle.....	IV	.90	.78
	V	.76	.83
	VI	.88	.59
	VIIA	.89	.85
	VII	.84	.69
	VIIIA	.83	.81
	VIII	.82	.78
	IX	.84	.82
Pierce.....	IVA	.87	.75
	IV	.58	.57
	VA	.85	.72
	V	.86	.79
	VIA	.92	.46
	VI	.93	.69
	VIIA	.92	.91
	VII	.97	.85
	VIIIA	.95	.60
	VIII	.60	.41
	IXA	.82	.67
	IX	.85	.45
Lawrence.....	IV	.83	.77
	V	.79	.54
Lawrence (*cont.*)	VI	.86	.79
	VII	.84	.67
	VIII	.88	.74
	IX	.92	.40
Heath.....	IV	.37	.50
	V	.87	.57
	VI	.77	.76
	VII	.83	.61
	VIII	.85	.63
	IX	.73	.45
Lincoln.....	IVA	.95	.80
	IV	.75	.48
	VA	.88	.40
	V	.72	.71
	VIA	.88	.76
	VI	.93	.80
	VIIA	.92	.50
	VII	.87	.74
	VIIIA	.89	.77
	VIII	.92	.56
	IXA	.91	.64
	IX	.89	.52

TABLE III. MISS WHEELER'S SCHOOL, PROVIDENCE, RHODE ISLAND. OTIS INTELLIGENCE SCALE

A. CLASSIFICATION OF PUPILS. GRADES IV TO VII INCLUSIVE

Form	Near Genius	Very Superior	Superior	Normal	Dull	Borderline	Total Number Tested
A	8	14	4	14	5	3	48
B	18	11	5	7	2	2	45

B. SCORES BY AGES. JUNIOR AND SENIOR HIGH-SCHOOL GRADES

Age	Forms A and B Averaged
13	151
14	158
15	166
16	173

C. SCORES IN FORMS A AND B FOR FIVE UPPER GRADES

Grade	Number Tested	Form A		Form B		Forms A and B Combined		Correlation Between A and B	Correlation (A and B Combined) with School Grades
		Average	Median	Average	Median	Average	Median		
VIII	24	133	141	149	153	140	148	0.901	0.801
IX	17	144	151	165	170	154	155	0.720	0.671
X	16	155	157	173	179	164	169	0.699	0.253
XI	24	154	151	173	172	163	164	0.896	0.345
XII	18	169	174	186	190	177	181	0.854	0.657
All Grades	99	150	154	168	173	159	164	0.827	0.487

TABLE IV. BELMONT (MASS.) JUNIOR HIGH SCHOOL. DISTRIBUTION AND OVERLAPPING OF PUPILS IN OTIS

TABLE IV. BELMONT (MASS.) JUNIOR HIGH SCHOOL. DISTRIBUTION AND OVERLAPPING OF PUPILS IN OTIS INTELLIGENCE SCALE

Scores	Form A			Form B		
	Grade VIII	Grade VII	Grades VII-VIII	Grade VIII	Grade VII	Grades VII-VIII
25–29	.....	1	1	.....	.....	.....
30–34	.....	2	2	.....	.....	.....
35–39	.....	0	0	.....	.....	.....
40–44	.....	2	2	.....	1	1
45–49	2	2	4	.....	0	0
50–54	1	4	5	.....	2	2
55–59	2	6	8	1	3	4
60–64	1	6	7	0	3	3
65–69	4	10	14	0	6	6
70–74	5	5	10	1	4	5
75–79	5	6	11	4	5	9
80–84	8	9	17	1	7	8
85–89	10	10	20	6	7	13
90–94	6	7	13	6	5	11
95–99	8	13	21	5	8	13
100–104	5	7	12	7	7	14
105–109	7	9	16	6	13	19
110–114	11	7	18	6	11	17
115–119	11	5	16	9	14	23
120–124	5	7	12	14	5	19
125–129	8	3	11	10	7	17
130–134	8	3	11	8	10	18
135–139	7	3	10	11	2	13
140–144	6	4	10	4	7	11
145–149	1	.....	1	6	4	10
150–154	4	.....	4	5	1	6
155–159	2	.....	2	3	3	6
160–164	1	.....	1	5	.....	5
165–169	0	.....	0	3	.....	3
170–174	2	.....	2	0	.....	0
175–179	.....	.....	.....	0	.....	0
180–184	.....	.....	.....	1	.....	1
185–189	.....	.....	.....	2	.....	2
Totals..	130	131	261	124	135	259
Medians	111	91	99	123	109	117
High ...	171	143	171	189	157	189
Low ...	47	27	27	59	41	41

For example, results obtained from Miss Wheeler's School (see Table III) show, from the fourth to seventh grades inclusive, that considerably more than half of the pupils tested fall in the classes near genius, very superior, or superior, while only a small percent are below the average. In the grades of both the junior and senior high school the medians of the two forms, when averaged and compared with age norms, are decidedly above the Otis medians for adult intelligence. Similar results are secured when the medians of the combined scores of the five upper grades are calculated, the range being from 148 to 181 inclusive—from 18 to 51 points above the Otis standards for adult intelligence.

Mr. Nickerson's results in the Belmont Junior High School, as shown in Tables IV and V, point in the same direction. For example, of 124 pupils in the eighth grade taking Form B, 97 attained ranks normal or above for their respective ages, and only 27 fell below this rank. Results were practically the same for the seventh grade. While the results were not on the whole as pronounced as in the case of the other schools, the evidence is clear that here the Otis standards are also too low.

TABLE V. BELMONT (MASS.) JUNIOR HIGH SCHOOL. PEARSON COEFFICIENTS OF CORRELATION

Forms A and B	0.90
Average scores and marks (English, arithmetic, geography)	0.55
Intelligence ratings and marks (English, arithmetic, geography)	0.61
Age-grade (youngest to oldest) and intelligence scores	0.34

According to the results in the Reading High School (Table VI), nearly 76 percent of the pupils tested show average mental ages at or above the grade in which they are working. Only 24 percent of the pupils tested have intelligence ratings below average; while 48 percent are above average—these latter falling into the superior, very superior, or near-genius groups.

The results obtained from the Bridgewater Normal School by Mr. Hunt (Figures 1 and 2) relate to students of adult age. Here the medians for all classes are decidedly above the Otis norms and the classification according to "coefficients of brightness" shows that there is not a single student below average, while 89 percent are above.

TABLE VI. READING (MASS.) HIGH SCHOOL.
RESULTS OF OTIS SCALE WITH 115 FIRST-YEAR PUPILS

A. DISTRIBUTION OF PUPILS BY TYPES ON THE BASIS OF THE OTIS REVISED NORMS

Classification	Percent of Pupils
Genius	0.8
Very Superior	32.2
Superior	15.6
Normal	27.1
Dull	15.6
Borderline	8.7

B. DISTRIBUTION OF PUPILS ACCORDING TO MENTAL AND CHRONOLOGICAL AGES

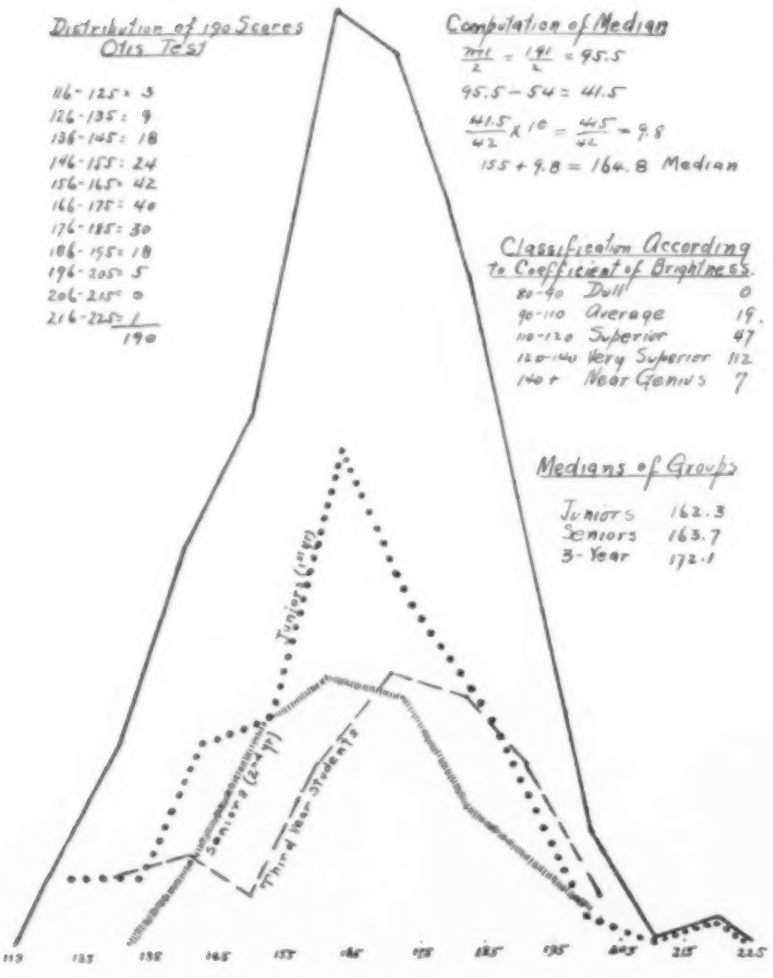
Percent of Cases	Average Mental Age	Average Chronological Age
3.0	10.6	14.8
6.0	11.4	14.8
9.0	12.5	14.9
15.0	13.4	14.7
15.0	14.4	14.6
5.0	15.6	14.5
3.0	16.5	14.7
7.0	17.2	14.8
37.0	18.0	14.2

Three possible explanations for the above results suggest themselves, namely: (1) the norms have not been carefully derived by Otis from representative groups; (2) the individuals examined in the tests here reported form a superior group; (3) the tests necessarily measure school accomplishment of a certain type (not merely general intelligence) and the individuals tested had superior instruction in those particular elements on which the tests are based. Of these three explanations we can probably exclude the second. It is hardly plausible that the pupils tested in the present study are markedly superior to the rank and file of school children, and that a large percent are in the superior and near-genius groups.

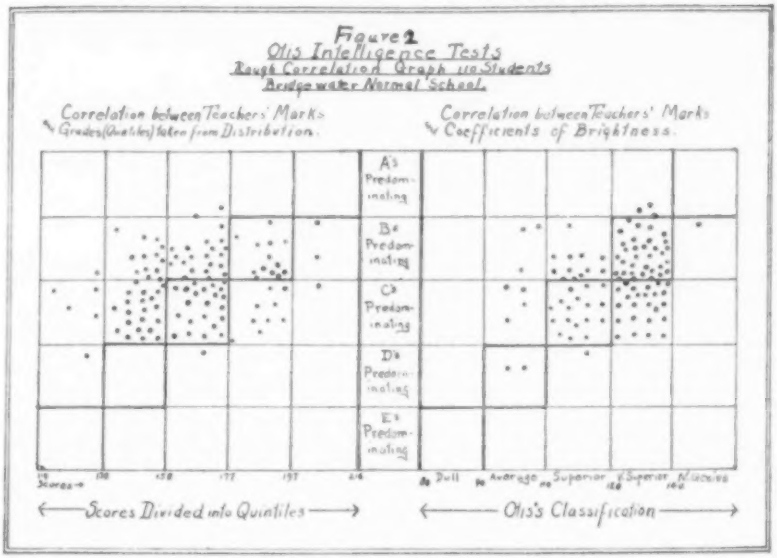
The first explanation is possible, though it is reasonable to assume that the norms derived by Otis are from fairly representative groups and constitute reasonable samplings of school children in general. It is also to be assumed that the norms as obtained by Otis from various sources have been carefully derived, and that there is no large error resulting from statistical inaccuracies. Even if such errors exist, they are not likely to be constant and would probably tend to even themselves up in the tabulation of the large number of cases on which the norms are based.

The third explanation seems the most reasonable in accounting for a substantial amount of the disagreement found between the Otis norms and the results here reported, namely, that the Otis tests furnish materials which give a greater advantage to the

Figure 1
Bridgewater Normal School



individuals tested in the present study than to those from whom Otis has obtained his norms. The Otis tests are primarily literary tests; they are based on a knowledge of words and skill in the use of words. They put a premium on linguistic ability, and make



it possible for pupils who have had superior training in this respect, other things being equal, to obtain higher scores.

And here a word in regard to intelligence tests in general may not be out of place. *No intelligence test yet devised, and in all probability none that ever can be devised, is capable of measuring general intelligence except indirectly.* These tests measure attainment which is conditioned on learning. When a group of individuals vary in any test in which all have had the same incentives for learning and the same opportunities and interests in learning, the assumption is that this variation is due to differences in original ability. For this reason not only are intelligence tests measures of original capacity, but so also are the various attainment tests in school subjects. Hence the Trabue Completion Test, devised as a measure of linguistic ability, is also a measure of intelligence; hence the Courtis arithmetic tests not only measure attainment in fundamental operations, but they likewise discriminate between the innate abilities of the children tested. *There has never been devised and there will probably never be devised a general test for general intelligence.* All tests are valid only within a group who have had identical or very similar opportunities for gaining familiarity with the materials of the test, and who not only have had the opportunity to learn, but likewise the desire to learn.

The fact that a group of girls score decidedly lower in the Stenquist Mechanical Ingenuity Tests than a similar group of boys does not prove by any means that girls are inferior in innate mechanical intelligence to boys. Neither does the fact that girls and women, almost without exception, show median scores inferior to those obtained by similar groups of boys and men in the Alpha Army Tests of necessity indicate that the former are inferior to the latter in general intelligence. It is not to be expected that intelligence tests can be standardized so as to measure the innate intelligence of diversified groups. Such tests are valid only as comparative measures within groups. It is very difficult, if not impossible, to compare the intelligence of dissimilar groups.

The practice effect shown by the fact that the median scores in the second test of the Otis pairs are considerably higher than those in the first set is, of course, to be expected. In the writer's experience this is almost certain to be true when any two tests, of approximately equal difficulty, are given to any group of fair size. In the case of hundreds of tests given to thousands of individuals either by the writer or under his direction, he has found but one instance when a reversal of this result occurred. This was in a group of about 35 seniors in the Women's College in Brown University in which the scores in a pair of the Trabue Completion Tests were somewhat higher in the first test than in the second.

In the case of the present study, on the average, the second test showed about a 10 percent improvement over the first. In one instance, the seventh grade of the Belmont Junior High School, a 20 percent improvement is shown (see Table IV). The results from Miss Wheeler's School are typical (see Table III). In the writer's experience the improvement to be expected in the second test over the first is from 6 to 10 percent. In this connection it is to be noted that in the Thorndike Intelligence Examination for High School Graduates the improvement in the second of two identical tests over the first, when preceded by a fore-exercise giving some familiarity with the nature of these two tests, is much reduced. Results obtained at Brown University with 285 freshmen of the Class of 1923, to whom the Thorndike tests were given, showed an improvement of less than 2 percent. Evidently some such device as a fore-exercise for preliminary orientation, or a spiral scheme in which the same type of test occurs again and again in the course of an examination, as is the case

with the Thurstone Psychological Examination is of considerable importance in the technic of administration.

Although the Otis tests seem to be of little value in discovering the exact intelligence ratings of those examined,[2] they are clearly useful in indicating the relative intelligence of the children tested within a given group. This fact is brought out by the agreement between the results of the tests and the school standing of the pupils examined. The correlations are, on the whole, pronounced, in some cases being unusually high. Forty-four correlations calculated between the test scores in the Brookline schools and the scholarship records give the lowest Pearson coefficient 0.40 and the highest 0.91. The median is 0.69. Seven of these coefficients are between 0.40 and 0.49, eight between 0.50 and 0.59, eight between 0.60 and 0.69, thirteen between 0.70 and 0.79, seven between 0.80 and 0.89, and one between 0.90 and 1.00 (see Table II).

In Miss Wheeler's School, correlations between scores in the tests and school standing were computed for the five upper grades. These varied from 0.253 to 0.801 when calculated grade for grade. The correlation of the scores of all the pupils tested in these five grades with their school marks was 0.487 (see Table III).

In the Belmont Junior High School, the average scores in the tests when compared with the average of school marks in English, arithmetic, and geography gave a Pearson coefficient of 0.55. When the scores were reduced to intelligence ratings the correlation was 0.61 (see Table V). Of 124 eighth-grade pupils taking the test, 97 obtained ranks normal or above for their respective ages. Of the 27 failing to attain such a rank, 17 failed to receive a passing mark in their school subjects. Five of the 27 were repeating the grade; seven were promoted on conditions; one was demoted; four were manual training specials. The rating of these pupils by their teachers was as follows: seven, fair; fifteen, poor; three, very poor. Of the 97 pupils who passed the test with scores at least normal, only 13 were estimated as below fair or passable in regular school work, 84 receiving marks of three or better (on a basis of five). The correlation between the C. B's. of these 124 pupils and their average rank in four school subjects

[2] The results set forth above are in substantial agreement with results reported to the writer by other investigators who have administered the tests in various school systems.

was 0.586. Results from a study of conditions in the seventh grade were very similar.

The data from the tests given to the freshmen of the Reading High School showed on the whole less definite results and gave low correlations with school standing, the Pearson coefficient between the I. Q.'s and the average of the academic grades being 0.344. In a total of 65 failures received in all subjects of the freshman year, 40 percent were made by those pupils who fell below the normal or average group according to the Otis classification, and 60 percent were made by those who were in the normal group or above it.

No correlation coefficients were obtained from the results obtained by Mr. Hunt at the Bridgewater Normal School. Figure 2, however, indicates that there is a close agreement both between teachers' marks and scores divided into quintiles, and teachers' marks and the calculated C. B.'s. Figure 1 shows also that the senior students are slightly superior to the junior students, while the three-year students (those taking a longer course than the one usually elected) are more definitely superior. Evidently the better course is elected by the more capable individuals.

One more fact of some significance may be noted, namely, that in most instances there is a substantial agreement between the results obtained from the two series of tests. The scores in Forms A and B were correlated in 49 instances with the following results: in fourteen instances the coefficient was between 0.90 and 1.00; in twenty-five instances, between 0.80 and 0.90; in seven instances, between 0.70 and 0.80; in one instance, between 0.60 and 0.70; in one instance, between 0.50 and 0.60; and in one instance, between 0.30 and 0.40.

The final conclusion to be drawn from an examination of the results of these tests is that they serve a very useful purpose in determining the comparative intelligence of school children and that their prognostic value is reasonably high. On the other hand, they are quite misleading as measures of absolute intelligence, and attempts to determine intelligence quotients or coefficients of brightness based on results obtained and interpreted in terms of the standards so far published by Otis are of little value. The Otis norms must be fundamentally revised before they can be accepted without correction.

CONDITIONS REVEALED BY THE USE OF STANDARDIZED TESTS IN RURAL SCHOOLS[1]

SAMUEL S. BROOKS
District Superintendent, Silver Lake, New Hampshire

While making out the graph cards of individual pupils for grading purposes as described in my last article, I gradually became conscious of certain similar tendencies affecting the majority of graphs. Not only was the variation great among individuals in different subjects but there was a certain sameness in it that struck me as being significant of fundamental weaknesses in the school system. If the graphs had been on transparent cards and placed in a pile, their low and high points would have tended to coincide. That is, in certain subjects most of the pupils tended to grade high throughout the district while in other subjects they tended to grade low.

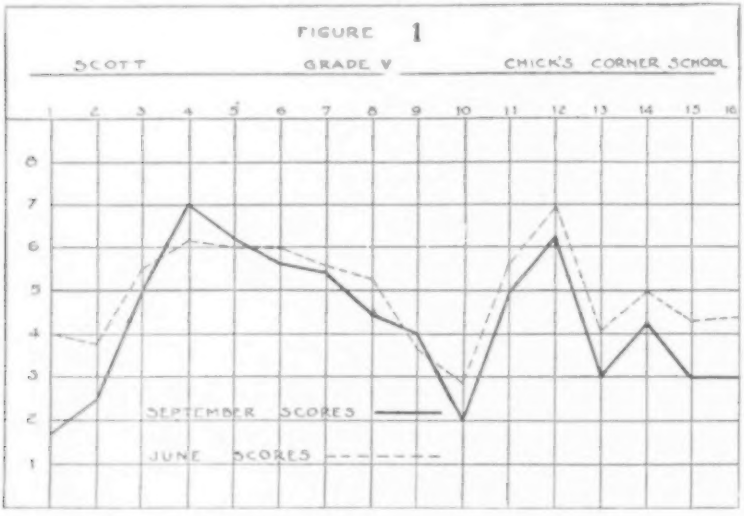
In the accompanying figures the numbers at the left of the horizontal lines represent the grades, while those at the top of the vertical lines stand for the various subjects as follows:

1. Rate of silent reading
2. Comprehension in reading
3. Addition
4. Subtraction
5. Multiplication
6. Division
7. Mixed fundamentals of arithmetic
8. Spelling
9. Writing, rate
10. Writing, quality
11. Arithmetical reasoning
12. English organization
13. Visual vocabulary
14. Language
15. Geography
16. History

In each of these figures the heavy horizontal line is drawn at the grade in which the pupil was placed as a result of the September testing. (See the third article of this series.) The solid lines show the grading of the pupils according to each of the tests at the beginning of the year; the broken lines show their grading at the end of the year. In interpreting these figures it should be remembered that the grading is based on June scores. In other words, if a child's score on any test equals the standard

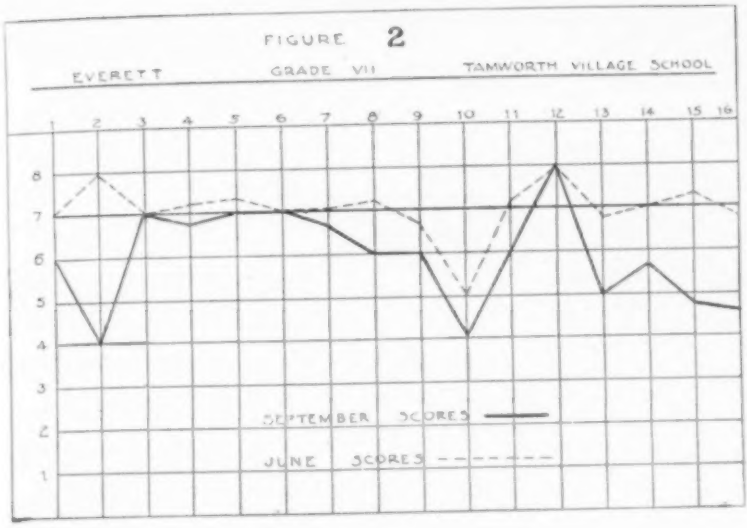
[1] This is the fourth article by Superintendent Brooks on the general topic "Putting Standardized Tests to Practical Use in Rural Schools."

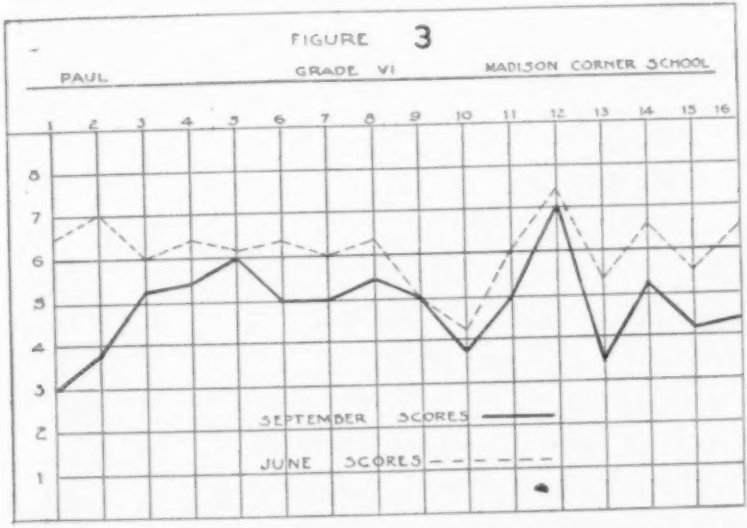
for the fourth grade, his performance is that of a child who has completed the fourth grade. Since his scores (obtained in September) indicate that he has already attained fourth-grade proficiency, he will naturally be placed in the class which is just beginning the fifth-grade work.



In Figure 1 the solid line shows the curve of Scott, a twelve-year-old, fifth-grade boy in one of the Sandwich schools, at the beginning of the year. The high and low points are more pronounced than in most cases. The solid lines in Figures 2 and 3 are the September curves of two other pupils drawn at random from among the cards of the Madison and Tamworth schools. All three of these pupils are normal or above according to the Otis Group Intelligence Scale. The broken lines in these figures are the end-of-the-year curves.

It will help in the understanding of the figures to take the case of a particular child. Consider the record of Paul (Figure 3). His score in the September test for rate of silent reading was 62. The third-grade score for rate of silent reading is 60. Accordingly, this boy showed third-grade ability in rate of silent reading in the first test. The first point on the solid line is therefore located at the intersection of the third-grade line with the vertical line No. 1. In the June test Paul's score for rate of silent reading





was 97. Since 97 is midway between 92 and 102, the standard scores for the sixth and seventh grades respectively, the first point on the broken line is located about half way between the sixth- and seventh-grade lines on the vertical line No. 1.

FIGURE 4

GRAPH SHOWING AVERAGE SCORES OF 62 NORMAL SEVENTH-GRADE PUPILS

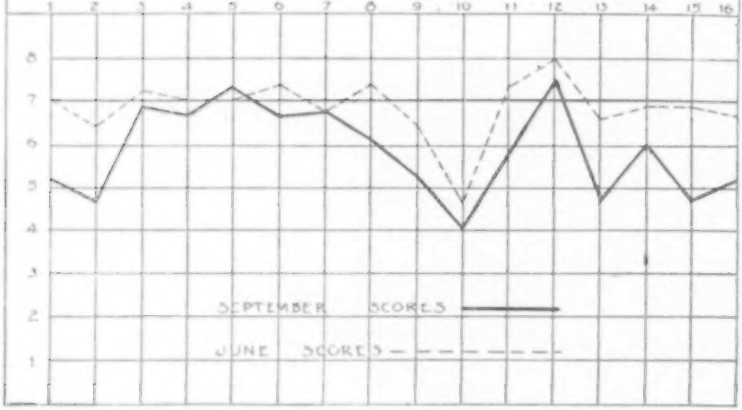
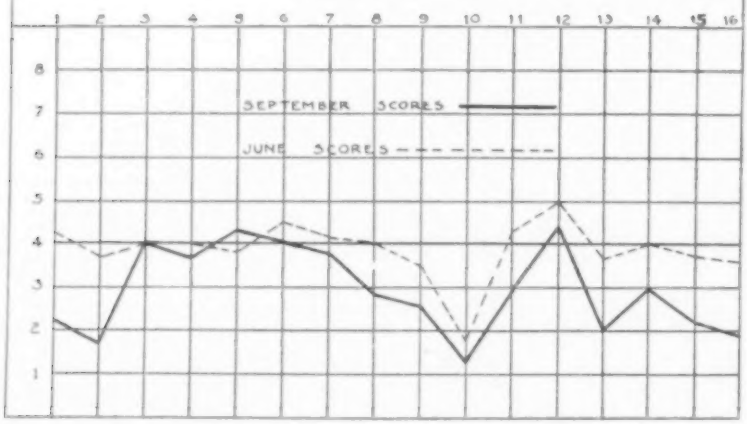


FIGURE 5

GRAPH SHOWING AVERAGE SCORES OF 104 NORMAL FOURTH-GRADE PUPILS



Similarly, in the first test his score for comprehension was 12, which is somewhat below the fourth-grade standard. His score on the second tests, however, was quite equal to the standard of the seventh grade.

The reader's attention is directed to the fact that in all the accompanying figures there is a tendency for the valleys and peaks of the curve for the June test to flatten out toward the horizontal. This represents the effect of the measures taken in these figures in the interim between September and June.

It will be noted that these pupils stood high in the four fundamental operations of arithmetic (Numbers 3, 4, 5, 6, and 7) and in Greene's English Organization Test (Number 12), which is mostly a test of general intelligence. In arithmetical reasoning or problem-solving (11), spelling (8), and language (14), they were near to grade standards. In rate (1) and comprehension (2) of silent reading, in rate (9) and quality (10) of handwriting, in visual vocabulary (13), and in the content subjects (15 and 16) each of these pupils ranked from low to very low.

The graphs of 72.24 percent of all the *normal* pupils above the third grade showed the same tendencies to a greater or less degree.[2] Figure 4 is a sort of composite graph of all the normal seventh-grade pupils in the district. They numbered 62. Figure 5 is a similar graph for the 104 normal fourth-grade children. These graphs were obtained by averaging the scores of the pupils in each separate subject and using the grades corresponding to the averages to locate the points on the graphs. For example, at the September test the average seventh-grade score for rate of silent reading was 95.2. This is a little above the standard fifth-grade score of 93. Hence the first point on the solid curve in Figure 4 is located just above the fifth-grade line. Similarly, the average of all the seventh-grade scores in comprehension of reading was 17.8. Since this is about two-thirds of the way from the fourth-grade standard toward that of the fifth grade, the second point is located two-thirds of the way between the fourth- and fifth-grade lines.

Having observed in the graphs these general tendencies of which I have spoken, I next made a survey of the time-tables and teaching methods in vogue in the district in order to formulate reasonable hypotheses to account for the conditions thus revealed and in order to aid in planning remedial measures.

The universally high scores in all the tested phases of arithmetic were indicative of over-emphasis on this subject. The

[2] In making this study the cards of all children who ranked below normal according to the intelligence tests were thrown out.

time-tables showed the relatively large amount of time assigned to arithmetic. The idea seems to be prevalent among teachers, pupils, and parents that arithmetic is the all-important subject. These schools are no doubt typical of the schools in small rural communities. Moreover, being widely scattered, they have little communication with each other. It would seem, therefore, that the results of this study fairly represent conditions in most of the smaller rural schools where standardized tests have not been used and where their diagnostic values have not been realized.

I am aware that these findings are contrary to those of more eminent workers who have found arithmetic to be a subject in which pupils usually grade low when measured by standardized tests. Possible reasons for this difference may be (1) that the results from *all* the pupils were considered instead of only the normal ones and (2) that their tests were given in city schools.

This over-emphasis on arithmetic in the smaller rural schools is not an unnatural condition. In fact there are sound reasons for it. In the first place, arithmetic is easier for the untrained teacher to teach than the content subjects. Fair results can probably be obtained with less mental effort on the part of the teacher in the teaching of arithmetic than in the teaching of history and geography. The work is largely a matter of drill, and drill is easy for the teacher. In the second place, teachers usually have more immediately obvious success in the teaching of arithmetic. It is human nature to like to do the things in which we best succeed. In the third place, pupils like arithmetic (a) because they enjoy good lively drill work in the fundamentals; (b) because they do not feel quite so much "at sea" in preparing an assignment of the next ten problems in arithmetic as they do in facing an assignment of the next ten pages in history or geography or physiology; and (c) because children like puzzles. The older pupils especially enjoy solving the problems of this character which our textbooks abundantly supply. In the fourth place, when it is left to the children to divide their study time among the different school subjects—as has been the common custom in unsupervised rural schools—an undue amount of time will usually be spent on arithmetic. Not knowing what to do with improperly assigned lessons in the content subjects, but knowing that they must keep busy at something, children will

turn to their arithmetics with which they feel most capable of doing independent work. Finally, the demands of parents on the teacher that their children be "learnt how to figger" is another factor in the situation. All these reasons cooperate in bringing about over-emphasis on arithmetic in the rural schools.

As the beginning of an attempt to remedy this condition we decided to reduce for a while the time devoted to arithmetic by one-half and to use the time thus gained for subjects in which the schools were making a poor showing.

Arithmetic was the only school subject in which there appeared a general tendency to rank very much above grade. The only other markedly high spot in the graphs was that denoting their grading in Greene's English Organization Test. In this test the pupils demonstrate their ability or lack of ability to rearrange broken sentences so as to make sense. Here is a sample of the disarranged sentences of which the test is composed:

wanted, to go home, him, the dog

Since this is largely a test of intelligence, the prevalent high scores of the pupils simply go to show that their low ratings in subjects other than arithmetic were not due to lack of mental ability, a fact also supported by their scores in the Otis Group Intelligence Scale.

The average scores for problem-solving in arithmetic were close to grade standards for each grade. The reason why the pupils did not do as well in this particular phase of arithmetical ability as they did in fundamentals will be discussed a little later. Spelling and language are other subjects in which drill work figures very prominently. Although on each of these two subjects there were wide differences between the lowest and highest scores in each grade, the averages were well up to or above standard, as shown by the solid lines in Figures 4 and 5.

Writing averaged the lowest of all the subjects in every school but one. The teacher of this school had received business college training and was good in muscular-movement penmanship. The low averages in writing led me to make a special investigation of the methods of teaching that subject in the district. A round of observation convinced me not only that the teaching of writing was being neglected but also that what teaching there was had little value. The copy-book method was in use in every school

except the one mentioned above. The teachers in general did not know how to teach writing. Therefore they had little success with it and did not like to teach it. Upon inquiry as to how the writing period was conducted, I learned that in several cases at least the teacher would simply tell the pupils to take their writing books and write for ten minutes. During this time she would sit at her desk and correct papers. At the end of the period, without even looking at the copy books she would tell them to put away their writing materials and go on with other work. In very few of the writing periods that I observed personally was there any adequate attempt to teach the children how to write. Is it strange that the writing scores were disgracefully low? I wonder if this condition is typical of schools in smaller rural communities with untrained teachers or is it a specialty of this district?

In an attempt to remedy the condition I tried to arouse the teachers to its seriousness, and I introduced a method of business writing into all the schools. This was somewhat of a venture since most of the teachers had had no training in muscular-movement writing. However, they were all informed regarding the correspondence course for teachers conducted by the publishers of the system, and were encouraged to take it. Several of them did so, and by the end of the year they were doing passable work as teachers of the new method.

As a result of this radical change the writing conditions in the schools are now in a somewhat chaotic condition. It takes time to break up the old finger-movement habits and perfect new ones. Hence the graphs show little improvement in writing scores for the year. We hope, however, that during the coming year a continuation of our efforts will produce definite improvement in the quality of handwriting.

The chief difficulty seems to be to get the children to use the muscular movement outside of the period of writing drill. Hereafter, in order to further our efforts, no written work will be accepted unless it is done with muscular movement. We believe it is largely a waste of time to compel a pupil to write with muscular movement for ten mintues a day and then to let him use finger movement in writing his compositions.

The reading scores were also scandalously low. Both the individual graphs (Figures 1, 2, and 3) and the grade graphs

(Figures 4 and 5) exhibit this fact in a striking manner. Analysis of the situation furnished several quite probable reasons for the poor showing in silent reading.

First, the pupils had not been taught silent reading. The reading drill in the schools was, and always had been, oral. Only two or three of the teachers had any conception of what is meant by silent-reading drill. The oral reading was conducted in the old-fashioned way which needs no description—and mostly in a slipshod manner at that. The fact that the children were tested for silent reading when all their class work had been in oral reading was probably the chief reason for the low scores.

Second, in most of the schools there was only one set of readers for each grade. The younger pupils knew most of the stories in the upper-grade books from hearing them read over and over by the older pupils. The fact that they knew the gist of these stories long before they ever reached the grades in which the books were used, that they had "studied" the lesson over several times at their seats (perhaps), and that each pupil was provided with a book in class, precluded any chance for real, live interest in the class drill. Many of the teachers, even, did not seem to be over-enthusiastic.

Third, the low scores resulting from the use of Thorndike's Visual Vocabulary Tests indicate that lack of word knowledge probably accounted to a large degree for the poor results in reading. It may well be that the narrow range of reading, due to lack of variety in books and to the conspicuous absence of school libraries, was responsible for the limited reading vocabularies of the children.

In the light of the above described conditions the low scores in content subjects need little explanation. Success in history, geography, etc., depends on ability to study effectively. Efficient study is efficient silent reading. Even in arithmetic, much if not most of the difficulty encountered by the pupils in solving problems lies in their inability to read and understand them as they appear in the text. Poor ability in silent reading, then, helps to explain why the scores in the problem-solving phase of arithmetic were so much lower than those in the fundamental operations.

These matters were brought to the attention of the teachers. They readily concluded that reading is the most important sub-

ject in the school, because upon it depends success in most of the other subjects. We therefore decided to give reading a place in the program commensurate with its importance. For the rest of the year most of the reading time was devoted to intensive drill in silent reading. Different methods of conducting this drill were devised in order to furnish variety and in order to keep interest alive. Much of the work in geography, history, physiology, civics, etc., was taken up as class drill in silent reading. Oral quizzes every few days by way of review in these subjects took the place of the customary daily question-and-answer recitation. In this way the time usually available for reading drill was quadrupled.

Did so much reading drill get monotonous? The children will testify that it did not. Did the content subjects suffer from giving up so much seat study and question-and-answer recitation? The graphs clearly indicate the answer.

We adopted also a definite policy of vocabulary building. New words were constantly introduced to the pupils by psychological methods. They were introduced as the names of ideas after the ideas themselves had been vividly brought to their attention by objects, pictures, or lively descriptions.

The number of reading books in the schools was multiplied by ten or twelve, and a generous beginning of school libraries was made. For the most part the new books were informational rather than merely entertaining. Yet they were books that appeal to children—and, indeed, they did appeal to them. Our difficulty now is not in getting the pupils to read but in getting them to do anything else but read.

What did it all amount to? Well, look at the broken lines in the preceding figures. They speak for themselves. They are the graphs of the same pupils and the same grades at the end of the school year.

PROVISION IN THE HIGH-SCHOOL CURRICULUM FOR CORRECTING PHYSICAL DEFECTS

ERNEST MCCLARY TODD
Physical Director, The Country Day School, Kansas City, Missouri

The course of study in physical education for secondary schools may be constructed to provide general physical training, or to include both general and specific training for the correction of defects. Of these the first is the current objective which has been approached through athletics and gymnasium exercises of a general sort. The second and more specific approach has been less used; yet is equally capable of use and is in some respects of greater importance.

In order to construct a course of study in physical education with provision for definite corrective work and in order to put it into operation in the school, four things are necessary. There must be: first, setting of standards of normality so that deviation from them may be measured; second, determination of the most serious defects common in the high-school population; third, collection of correctives; and fourth, provision of administrative machinery so that the school program may permit those having common defects to be taught at the same time.

In the Country Day School, a preparatory school for boys, of Kansas City, Missouri, these problems have been attacked. Definite standards for each age from 12 to 20 inclusive were obtained for standing height, sitting height, weight, chest girth, expansion, grip of right and grip of left hand. The standards for standing height, sitting height, weight and chest girth were taken from Porter.[1]

Those for expansion and right and left grip were obtained by the measurement of 250 boys of each age in central Missouri schools.

All these standards were tabulated by ages and then arranged into percentile divisions, as shown in Tables I to VII inclusive.

[1] Porter, W. Townsend, "Growth of St. Louis school children," *Transactions of the St. Louis Academy of Science*, 6:248 ff., 1893.

TABLE I. STANDING HEIGHT (IN INCHES)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	58.9	61.3	64.1	67	68.3	69.7	71.6	74	74.2
90	2	57.8	60.4	62.6	66.1	67.3	68.9	70.8	73	73.5
80	3	56.7	58.8	61.3	64.3	66.3	67.9	69.9	72.5	72.5
70	4	55.8	57.8	60.3	63	65.1	67	68.7	72.3	72.3
60	5	55.2	57.1	59.3	61.9	64.2	66.1	67.9	71.9	71.8
50	6	54.5	56.4	58.6	61.1	63.4	65.3	66.8	70.4	71
40	7	53.8	55.6	57.6	60	62.7	64.6	65.9	69.3	70.7
30	8	53.2	54.9	56.9	59.1	61.6	63.7	65	68.5	70.3
20	9	52.4	54	56	58.1	60.6	62.8	64.1	67.8	70
10	10	51.4	52.8	54.9	56.5	58.8	61.7	63.3	66.5	69.9
5	11	50.6	51.7	53.9	55.4	57.6	60.9	62.4	65.6	68.8

TABLE II. SITTING HEIGHT (IN INCHES)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	31	31.8	33.6	34.8	35.9	37	37.3	38.4	39.6
90	2	30.3	31.1	32.6	34	35	36.3	37	37.9	39.3
80	3	29.7	30.5	31.7	33.3	34.1	35.4	36.6	37.2	39.1
70	4	29.3	30	31.1	32.5	33.7	35	36	36.5	38.9
60	5	28.9	29.8	30.6	31.8	33.2	34.6	35.2	35.8	38.5
50	6	28.6	29.3	30.1	31.3	32.7	33.9	34.5	35.2	38.1
40	7	28.2	28.9	29.8	30.8	32.2	33.6	34.2	34.8	37.8
30	8	27.9	28.5	29.5	30.3	31.4	33.1	33.9	34.4	37
20	9	27.5	28.1	29	29.8	30.9	32.4	33.6	34.1	36.9
10	10	26.9	27.5	28.2	29.2	30	31.4	33.1	33.3	35.2
5	11	26.6	27	27.7	28.6	29.3	30.6	32.2	33	34.4

TABLE III. WEIGHT (IN POUNDS)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	91.1	104.2	118.7	132.6	147.7	142.7	156	167	169
90	2	86.2	95.4	110.7	125.6	140.5	140.6	150	160	163
80	3	81.2	89.7	102.9	117.3	129.7	136.2	146	155	159
70	4	78.2	85.5	96.7	110	125.1	132.5	142	149	155
65	5	75.6	82.2	92.3	105	119.9	125.7	137	144	150
50	6	73.5	79.7	87.9	100	114	121.6	134	139	144
40	7	71.3	76.6	84.7	94.9	108.9	119.4	131	135	140
30	8	68.7	73.9	81.6	90.3	102.8	115.5	128	130	137
20	9	66.1	70.7	78.5	85.8	98	112.8	124	124	132
10	10	62.8	67	74	81.5	87.7	104.3	119	121	128
5	11	60.4	64.4	70.4	78.6	82.9	99.9	112	117	125

TABLE IV. CHEST GIRTH (IN INCHES)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	30	31.1	32.5	34	35.4	35.4	36	36.8	39.3
90	2	29.3	30.4	31.7	33.2	34.5	34.8	35.5	36.3	38.7
80	3	28.6	29.4	30.7	32.2	33.2	34	34.7	35.7	38.4
70	4	28	28.8	30.2	31.4	32.6	33.4	34.4	35.2	37.6
60	5	27.6	28.4	29.4	30.8	32	32.7	34	34.8	37.1
50	6	27.2	27.9	28.8	30.2	31.4	32.3	33.6	34.1	36.5
40	7	26.8	27.5	28.4	29.7	30.8	31.9	33.2	33.4	36
30	8	26.4	27	27.9	29	30.1	31.3	32.9	32.9	35.4
20	9	25.9	26.6	27.3	28.5	29.3	30.7	32.1	32.5	34.9
10	10	25.2	25.7	26.6	27.6	28.2	29.7	31.4	31.8	34.4
5	11	24.7	25.1	26	26.9	27.3	27.9	29.5	31.4	33.6

TABLE V. EXPANSION (IN INCHES)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	3.1	3.8	4	5.1	4.9	5.1	5.3	5.7	6
90	2	3	3.7	3.8	4.7	4.7	4.9	5.1	5.4	5.6
80	3	2.8	3.5	3.7	4.6	4.5	4.6	4.9	5	5.3
70	4	2.6	3.2	3.5	4.2	4.1	4	4.4	4.8	4.9
60	5	2.3	2.8	3.1	3.6	3.8	3.4	4.1	4.3	4.5
50	6	2.2	2.5	2.6	3.4	3.2	3	3.7	4	4.4
40	7	2.1	2.3	2.4	3	2.8	2.9	3.2	3.8	4.3
30	8	2	2.2	2.3	2.6	2.4	2.5	2.8	3.5	4.1
20	9	1.8	1.9	2.1	2.3	2.3	2.3	2.1	3.3	3.8
10	10	1.6	1.6	1.8	2	2	2.1	2	3	3.6
5	11	1.3	1.5	1.6	1.8	1.9	1.9	1.9	2.8	2.9

TABLE VI. RIGHT GRIP (IN KILOGRAMS)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	60	61	68	100	104	118	122	138	150
90	2	59.5	60.1	62.9	82	94	116	120	135	148
80	3	57	58	60	73	88	114.2	118	129.1	145
70	4	54	55	58	64	87	113.3	116.3	127	143.2
60	5	51	51.7	56	59	84.6	111.1	114	125.6	141.1
50	6	49.1	49.3	49.7	55	83.9	109.6	111.4	118.4	140
40	7	44	45	46	49.1	82	107	108.2	115	136
30	8	42	42.4	42.7	47	78	105.1	105	112.3	134
20	9	41	41.2	41.3	44	76.1	104	102.2	109.1	128.2
10	10	38	38.4	38.5	42	75	99.8	98.2	102.7	118.9
5	11	36	36.5	36.5	40	74	97	96	100.4	116

TABLE VII. LEFT GRIP (IN KILOGRAMS)

Percentile	Rank	Age								
		12	13	14	15	16	17	18	19	20
95	1	59	59.8	67	99.2	102	115	120	133	148
90	2	57	58	62.6	80.1	94	113.4	119	130	146
80	3	54	54.3	60	70.9	86.3	112	118	126.8	144
70	4	52	51	58	62	86	110	116	124.3	142
60	5	49	49.9	55	58	82	108.9	113	118	139.2
50	6	48	48.9	49.4	53.7	82	107.2	110	114.4	137
40	7	44	45	44	48.8	80	104.6	106.8	109.4	134
30	8	42	42.2	42.5	46	78	101.9	104	106	130.1
20	9	41	41	41.2	43	76	101	100	104	124.3
10	10	38	37.9	38	41.8	74.8	98.1	98	101.5	117.2
5	11	36	36.4	36.4	39	74	95	94	100	115

The 95-percentile indicates the upper limit of rank, the 90-percentile, rank two, and so forth; so that in giving a student his standing he was told only that he was in rank one, or two, or whatever his measurements justified, thus obviating technical nomenclature.

The division of standards into percentiles is of the greatest importance for corrective purposes. Obviously, if the median is set as the standard, then any student above median will feel that he has reached standard and does not need to improve, while any student who is very low may be discouraged because of his failure to reach standard immediately. The provision of many standards is vital in stimulating the student to try for the next rank above, whether he be below or above the median. The steps are comparatively short and so easily made that the encouragement that comes from obtaining the next higher stimulates enthusiasm and effort.

In addition to the measurements mentioned, other items for which less definite standards are necessary were included. These were bad posture, under-developed legs, under-developed arms, abnormal heart, uncleanliness, bad teeth, adenoids, chronic throat trouble, deformed feet, and eye strain. These are important, but may be recognized by the examiner without the use of a close standard—such as is advisable for expansion or grip.

Perfection in these seventeen items constitutes the objective toward which the corrective exercises were directed according to the standards for each age.

It is obvious, of course, that some of the defects (such as low sitting or standing height) would not be directly and in isolation amenable to correction. Indirectly, however, and in combination with other weaknesses, even these defects may be improved. Likewise, some of the defects, such as adenoids, would be given medical attention; it being the function of the physical director merely to call attention to the need. The range of corrective gymnastics should include all defects between those not attacked directly and those yielding only to medical treatment.

At the Country Day School, pupils' defects were determined each year by examination. The primary examination occurred in September; and, in order to record progress, re-examinations were made in January and in June. Data cards, one of which is shown, were provided for each student.

These cards were used by the physical director and by the boy himself for reference and record. In addition, they were used in a more general way to provide the material for compilations which served to arouse and maintain the interest of the whole school in the undertaking. For example, there were compilations of especially notable measurements of individuals, of high averages, of comparative ranks by classes, teams, and ages. The competitive instinct was played upon frankly. If interest lagged, new material appeared upon the bulletin board. By comparisons with other schools and in various other ways the strengths as well as the weaknesses of this particular school population were brought forward. While this necessitated considerable work, particularly at the time of the January and June re-examinations, the results justified it.

Table VIII indicates in a general way the improvement noted in the year and a half immediately following the introduction of the system into the Country Day School.

A very material climbing into the higher ranks will be noticed between the September examinations of each school year and the next later re-examination. It will be noticed, too, that while the September, 1918 percents are better than those of September, 1917, they are not as high as those of June, 1918. This

SAMPLE OF DATA CARD

COUNTRY DAY SCHOOL

PHYSICAL EXAMINATION

Student A. B.
Age 15
Class Sophomore
Year. 1917-18

	September		January		May	
	Units	Rank	Units	Rank	Units	Rank
Standing height (in.)	71.4	1				
Sitting height (in.)	38.2	1				
Weight (lbs.)	146.5	1				
Chest girth. (in.)	34.	1				
Expansion (in.)	4.	5				
Right grip (kg.)	90.	2				
Left grip (kg.)	84.	2				
	Aver.	2	Aver.		Aver.	

Posture
Under-developed legs
Under-developed arms Corrected Jan.
Heart
Uncleanliness
Teeth
Adenoids
Throat
Eyes
Feet Ingrown nails. Corrected Jan.
Remarks Permit all athletics. Place in Class C. gymnasium to correct arms.

E.M.T. Examiner.

was due, not to retrogression during the vacation months, but to the induction of new boys into the school.

TABLE VIII. IMPROVEMENT IN PHYSICAL CHARACTERISTICS, SEPTEMBER, 1917–JANUARY, 1919

	September 1917	June 1918	September 1918	January 1919
Percent of boys who ranked 3 or better	38	44	42	43
Percent of boys who ranked 6 or better	65	78	87	93
Percent of boys who ranked 9 or better	91	97	92	96
Percent of boys who ranked below 9	8	2	7	3

The provision of correctives for the defects discovered by examination is a comparatively simple matter. This knowledge is common in physical education literature, and the physical director is already acquainted with it. It is sufficient here to say that the development of any given part of the body, and the correction of flat feet, postural faults and similar defects are directly and surely influenced by physical training; while the digestive, nervous, and circulatory systems are little less directly and surely capable of being influenced.

But a more serious task is the provision of a program which will permit special attention to small groups. This attention to small groups is vital if the best corrective work is to be done. For example, it will be found advisable to provide a curriculum such that separate classes in physical training may be available first for normal boys (Class A); second for boys who are organically and mechanically sound but who have poor general musculature (Class B); and third for three different sections of boys in need of special corrective attention (Class C). For Class A boys the usual athletics may be used, if care be taken to remember that a normal boy is not necessarily a perfect one, and that normality may not maintain itself always. For Class B boys, athletic games are beyond doubt needed for their general development, but there are difficulties. If they were greatly interested in athletics they would not be Class B boys, so usually it will be found wise to put them into a special gymnasium class while

starting their development, and by fostering a real liking for athletics, enable them to go on for themselves when compulsion is withdrawn.

In Class C, three sections will be found advisable. In one will be placed those boys who are incapacitated for usual exercise forms, boys with flat feet, subnormal heart, very poor expansion, or crippled permanently or temporarily. This section should never care for more than ten pupils, and in general, not more than one in forty will be found belonging here. The second section will include most boys with postural faults, those needing especially development of the shoulders, chest, and arms. In the third section may be placed boys in need of specialization in the development of legs, torso (including digestive corrections), and those extremely fat or extremely thin. These two sections need not be limited in numbers.

The reason for the necessity of these divisions is that otherwise each boy in a given class spends one-third of his time correcting his own defects and two-thirds of his time doing work to correct defects which he does not have.

No sacrifice of academic schedule and no added cost are necessary in order to provide for a course of study in physical education such as is needed. It is only necessary to arrange the program before beginning the work, in order to coordinate the physical and academic schedules.

The curriculum suggested is written without any attempt to lay down a *school* curriculum. Only those parts of it which relate to physical education are advocated. The academic subjects are chosen more or less at random, the only care taken being to see that the number of subjects listed corresponds to the number which is usual in high-school courses of study.

As to the time schedule, that one is purposely chosen into which it is hardest to fit physical education work. The schedule of the day is taken to include forty-five minute periods, beginning at nine o'clock and continuing until four, with an hour for lunch. The tendency is away from this schedule, but if the right kind of courses in physical education can be fitted into this old schedule they can be fitted into any.

Three points are to be kept in mind. First, provision is to be made for the various divisions previously mentioned. Normal

students and those in need of corrective work cannot with safety be put into the same classes. Second, provision is to be made for holding some of the physical education classes during the school day. Unless this is arranged, part of the needed instruction cannot be given; the work loses caste by becoming purely an after-school activity; the physical director, who is supposedly a specialist, must either remain idle or be used to teach other subjects in which he may or may not be expert; and an expensive gymnasium and plant remain idle during much of the time. Third, physical and academic schedules must be coordinated to further the best interests of both.

Keeping these things in mind and using the nine to four school day, the following curriculum for a four-year high school is suggested.

FRESHMAN YEAR

Required	*Elective*
Mathematics I	Modern Languages I
English I	Classical Languages I
History I	Music
Beginning Gymnasium	Athletics
Practical Hygiene	Military Training

SOPHOMORE YEAR

Required	*Elective*
Mathematics II	History II
English II	Classical Languages II
Gymnasium	Modern Languages II
	Music
	Manual Training
	Science
	Athletics
	Military Training

JUNIOR YEAR

Required	*Elective*
Mathematics III	History III
English III	Classical Languages III
At least one physical education elective	Modern Languages III
	Music
	Science
	Agriculture
	Manual Training
	Military Training
	Athletics
	Advanced Gymnasium

SENIOR YEAR

Required	*Elective*
English IV	Mathematics IV
At least one physical education elective	History IV
	Classical Languages IV
	Modern Languages IV
	Music
	Agriculture
	Science
	Athletics
	Manual Training
	Military Training
	Advanced Gymnasium

It is, of course, understood that individual schools will have their own regulations regarding certain of these electives whether required singly or in groups. Whatever these conditions are, it is maintained that a school can continue to use the usual four major subjects and the usual minors and still have room in the curriculum for a real course of physical training.

Practical hygiene takes up only three periods a week; the military training, if given, two periods a week, plus a Saturday morning session, which many schools omit as unnecessary. Athletics come after school hours; and the remaining work fits into the schedule without friction. Not even a curtailment of study periods, which would be justified if needed to keep a boy fit, is necessary. Three sample programs show proof of this.

SAMPLE PROGRAMS

I. FRESHMAN BOYS. CLASS C. CORRECTIVE

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9–9:45	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Military?
9:45–10:30	Gym	Study	Gym	Study	Gym	Military?
10:30–11:15	English	English	English	English	English	
11:15–12	Study	Study	Study	Study	Study	
12–1	Lunch	Lunch	Lunch	Lunch	Lunch	
1–1:45	Latin	Latin	Latin	Latin	Latin	
1:45–2:30	Study	Study	Study	Study	Study	
2:30–3:15	History	History	History	History	History	
3:15–4	Hygiene	Military	Hygiene	Military	Hygiene	
4–5:30	Athletics	Athletics	Athletics	Athletics	Athletics	

II. SOPHOMORE BOYS. CLASS A. NORMAL

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9–9:45	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Military?
9:45–10:30	Study	Study	Study	Study	Study	Military?
10:30–11:15	Gym	Boxing	Gym	Boxing	Study	
11:15–12	English	English	English	English	English	
12–1	Lunch	Lunch	Lunch	Lunch	Lunch	
1–1:45	History	History	History	History	History	
1:45–2:30	Study	Study	Study	Study	Study	
2:30–3:15	French	French	French	French	French	
3:15–4	Study	Military	Study	Military	Study	
4–5:30	Athletics	Athletics	Athletics	Athletics	Athletics	

III. JUNIOR BOYS. CLASS B. POOR GENERAL MUSCULATURE

Period	Monday	Tuesday	Wdnesday	Thursday	Friday	Saturday
9–9:45	English	English	English	English	English	Military?
9:45–10:30	Study	Study	Study	Study	Study	Military?
10:30–11:15	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	
11:15–12	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture	
12–1	Lunch	Lunch	Lunch	Lunch	Lunch	
1–1:45	Study	Study	Study	Study	Study	
1:45–2:30	French	French	French	French	French	
2:30–3:15	Gym	Study	Gym	Study	Gym	
3:15–4	Mech. D.	Military	Mech. D.	Military	Mech. D.	
4–5:30	Athletics	Athletics	Athletics	Athletics	Athletics	

The course of study in physical training, except in cases where the school is so large that sections of classes must be duplicated, is such that it may be handled by one man.

IV. TEACHER'S PROGRAM OF PHYSICAL WORK FOR HIGH SCHOOL

Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9–9:45	Corr. Gym 1		Corr. Gym 1		Corr. Gym 1	Military?
9:45–10:30	Corr. Gym 2	Tumbl.	Corr. Gym 2	Tumbl.	Corr. Gym 2	Military?
10:30–11:15	Adv. Gym	Boxing	Adv. Gym	Boxing	Adv. Gym	
11:15–12	Begn. Gym	Wrestling	Begn. Gym	Wrestling	Begn. Gym	
12–1	Lunch	Lunch	Lunch	Lunch	Lunch	
1–1:45						
1:45–2:30	Corr. Gym 3		Corr. Gym 3		Corr. Gym 3	
2:30–3:15	Class B Gym		Class B Gym		Class B Gym	
3:15–4	Hygiene	Military	Hygiene	Military	Hygiene	
4–5:30	Athletics	Athletics	Athletics	Athletics	Athletics	

This program, as it stands, may be lightened by the removal of military, and may, in a given year, not need all the corrective sections.

THE RETENTION OF FOREIGN LANGUAGE IN THE HOME

RIVERDA HARDING JORDAN
Dartmouth College

The solution of the problem of Americanization is largely dependent upon the early acquisition of English by the newly arrived immigrant as his ordinary medium of communication. Whatever strides he may make in other directions toward an understanding of the ways and customs of the land of his adoption, the newcomer can hardly be said to be ready for the assumption of the duties of a citizen of this republic until he is decidedly familiar with the new language. Accordingly, in order that he may secure the necessary familiarity with English, the utmost time and effort of directors of Americanization are employed to the end that the immigrant may be given the privileges of schools for children and adults in the daytime or the evening. Even with these agencies, the question is not entirely settled as to what constitutes a real command of language or what would indicate true assimilation of it by the foreign-born.

Teachers of language are pretty well agreed that a proper command of a foreign tongue is not acquired until the student finds himself thinking in the new medium. If this be accepted as a reasonable test of the immigrant's assimilation into the new national life, what may be considered some of the visible signs and outward manifestations of such ability? Probably the natural answer would be to say that the whole question may be summed up in the statement, "Habitual use of English in the everyday affairs of life." Unfortunately, the ordinary affairs of life involve a number of diverse factors—the life of the store and the workshop, the life of the street and the country, the life of the church and the lodge, the life of the recreation hour, the life of the home. Of all these the last is probably closest to being the ultimate test. Here outside restraints are laid aside and the family meets on the most natural and unconstrained basis. Accordingly, the tendency to "think aloud" is more nearly realized in the home than elsewhere. Moreover, it is here that the real influences of day, eve-

ning, and continuation schools are most directly felt and applied. If the proper inspiration has been given in the classroom, the home will become the laboratory for the practice of the new acquisition. Freed from the fear of ridicule or the danger of reprimand, the family will use the meal time or the evening recital of the events of the day as an opportunity to practice the English language. Thus it will soon become in reality the vehicle of thought, and the first and most important step toward assimilation will have been taken. On the other hand, if the language of the fatherland continues to be the medium of communication at home, not only is a great educational opportunity overlooked by the newcomers, but by the maintenance of the foreign atmosphere in the home the real adoption of the United States as a new homeland is deferred, and, it is to be feared, sometimes permanently prevented. The experience of the past three years has given ample demonstration of the fact that such conditions exist to a far greater degree than had before been supposed.

Many still feel, however, that such unfortunate conditions are to be found principally in the congested districts of our largest cities, especially on the Atlantic seaboard, and in the scattered colonies known as "Little Russias" and "Little Italies" which are found throughout the land. They feel that in the majority of communities where the foreign element is not predominant and the general tendency is to patronize the public schools, no very serious result will follow even if the older members of the family do for a time after their arrival in this country continue to speak the foreign tongue at home. In such communities the principal burden is laid upon the school. The supposition is that, while the parents must use English in their commercial pursuits, the pupils will become so accustomed to using it in school and at play, that they will continue to speak English at home. Thus, it is assumed that without any very conscious or special effort the whole family will shortly find itself using English to the total displacement of the foreign tongue. Unquestionably, this has happened in a number of instances and communities. But there is good ground to believe that, even where the public school has been an important factor in the community, the persistence of the foreign language is much more stubborn and widespread than has been suspected. A recent investigation by the writer has thrown considerable light

upon the situation and gives food for thought to those who have been disposed to stress too greatly the involuntary transfer of the influence of the school into the home, as well as to those who have felt that continued residence in an Americanized community is in itself an earnest of assimilation.

In connection with a study,[1] made during the years 1918–1919, of the relationship existing between nationality and progress of children in school, the writer investigated the cases of 2,584 parents of children of foreign extraction attending the public schools of Minneapolis and St. Paul. Those children were included in the study whose parents or grandparents were born outside of the United States. In almost all cases the children themselves were native born, and to insure as far as possible that they had been in a school environment long enough to escape the supposed retarding influence of the foreign language in the home, children from only the sixth, seventh, and eighth grades were studied. Among other questions each child was asked: "What language does your father speak at home?" "What language does your mother speak at home?" "What language, besides English, can you speak?" "What language, besides English, can you understand?" "How long has your father been in the United States?" "Your mother?" The birthplace of father, mother, and child were requested. In considering the results, one must remember that these were public school children in schools where English had been continuously the language of instruction; that they were children at least eleven years of age; and that they were interrogated during the period of the war when the tendency to indicate use of English at home would have been greater than at any other time.

Table I gives in the first column the total number of parents of each nationality studied; in column 2, the number who speak English as the language of the home; and the third column gives the percent of column 2 to column 1. The fact that the Germans head the list in acquisition of English is partially explained by the fact that there was a tendency to a refusal to answer the questions or to answer falsely on the part of German-speaking

[1] Jordan, R. H. *Nationality and school progress.* Bloomington, Illinois: Public School Publishing Company. (In press.)

TABLE I. COMPARATIVE TABLE OF NATIONALITIES, SHOWING NUMBER AND PERCENT OF FOREIGN-BORN PARENTS WHO HAVE ADOPTED ENGLISH AS THE LANGUAGE OF THE HOME

Nationality	Total Parents	Number Speaking English	Percent Speaking English
Bohemian	36	6	16.6
Slovakian	77	5	6.5
Norwegian	396	128	32.3
Swedish	802	265	33.0
German	201	123	61.2
Austrian	126	10	7.9
Danish	63	26	41.3
Finnish	86	1	1.1
Roumanian Jew	234	35	15.0
Russian Jew	526	45	8.5
Italian	37	3	8.1

TABLE II. PERSISTENCE OF FOREIGN LANGUAGE SHOWN BY NUMBER AND PERCENT OF FOREIGN-BORN PARENTS WHO RETAIN THE FOREIGN LANGUAGE AS THE HOME LANGUAGE, ALTHOUGH THEY HAVE LIVED IN AMERICA TEN YEARS OR MORE

Nationality	Total Parents	Years Lived in the United States					
		10 to 19		20 to 29		30 and more	
		Number	Percent	Number	Percent	Number	Percent
Germany	201	14	7.0	9	4.4	22	10.9
Danish	63	5	7.9	7	11.1	5	7.9
Norwegian	396	69	17.4	48	12.1	76	19.2
Swedish	802	93	11.6	166	20.7	134	16.7
Austrian	126	30	23.8	23	18.2	12	9.5
Roumanian Jew	234	123	52.6	18	7.7	5	2.1
Italian	37	5	13.5	16	43.2	3	8.1
Bohemian	36	6	16.6	10	27.7	10	27.7
Slovakian	77	22	28.5	20	25.9	18	23.3
Russian Jew	526	237	45.0	145	27.5	32	6.1
Finnish	86	38	44.1	23	26.7	14	16.2

children. In two cases the child replied: "I don't want to tell!" How far this affects the result is a question. In the mind of the writer the effect would not be very great, probably not great enough to displace the German group from its position of primacy. The entire significance of the table is not understood until it is studied in connection with Table II. Here again we have in column 1 the total number studied; in column 2 the number who have lived in this country from ten to nineteen years, inclusive, and who still speak the foreign language at home; column 3 shows the percent of these to the total; columns 4 and 5 give the same data for those who have lived in this country from twenty to twenty-nine years, inclusive; and columns 6 and 7 for those who have lived here thirty years or longer. Figures 1 and 2 show graphically the same facts as Tables I and II.

When we note that only one Finn out of 86 uses English as the home tongue and that 75 of these Finns have lived in this country ten years or longer, we must confess that the influence of the general environment of the public school and of the social and commercial requirements of the city have not been extremely effective since they have permeated the home to no greater extent than is indicated. In the same way the tables show that 5 of 77 Slovaks speak English at home, although 60 of the 77 have lived here at least ten years; and that of 802 Swedes 393, or 49 percent have lived here ten years, but speak Swedish at home. The last column of Table II is even more significant. When 28 percent of the Bohemians, 19 percent of the Norwegians, 17 percent of the Swedes, 11 percent of the Germans have lived in this country 30 years or longer—most of them continuously in a predominantly English-speaking community[2] with every opportunity to acquire the new language—and when these families have not felt the need of using English at home, the conclusion is forced that a much more vital factor is required than has been applied in the past in order to secure this basic element of Americanization. Some individual cases are even more startling: two Swedes, one German, one Finn, and one Russian have lived in this country fifty years and still speak the foreign language in the home circle!

[2] The United States census of 1910 showed that 28.5 percent only of the population of Minneapolis and 26.3 percent of the population of St. Paul were foreign-born.

Six Norwegians and five Swedes have been here forty-five years or more but do not speak English at home.

In Table III a still more serious situation is found, for this table gives the data for 125 parents who were themselves born in this country, but who speak the foreign language as the home medium.

TABLE III. DISTRIBUTION OF PARENTS BORN IN THE UNITED STATES WHO SPEAK A FOREIGN LANGUAGE HABITUALLY AT HOME

Nationality	Father Only	Mother Only	Both	Total Parents
Bohemian	1	6	0	7
Slovakian	0	4	0	4
Norwegian	3	14	6	29
Swedish	7	19	9	44
German	2	8	5	20
Finnish	2	4	2	10
Russian Jew	2	2	0	4
French Canadian	3	4	0	7
Total	20	61	22	125

In nine Swedish families, six Norwegian, and five German, both parents were born in the United States but do not speak English at home! The tendency of the mothers to make the language of their mothers the domestic language is shown by the greater number of the native-born mothers who use the foreign language, than of the fathers. The potent factor in most of these cases is the presence in the home of a foreign-born grandfather or grandmother who has never learned English; but this factor certainly should not go farther than to make necessary a type of bilinguality which is in large part excusable. The comparative influence of the mother in determining the home atmosphere is brought out very definitely by this table. The whole situation is more clearly presented to us when cases of individual homes are examined. In one case, a Norwegian-born husband married an American-born wife, and although the husband has lived here for 35 years, both speak Norwegian in the home circle. Another case is exactly similar save that the husband has been here but

29 years. An American-born husband, of American-born parents married a Norwegian-born wife; he speaks English at home but, despite her thirty years' residence here, his wife clings to Norwegian as the home tongue. Another American-born husband is more complaisant; and since his Swedish-born wife in her thirty-four years' life here has not acquired English, he also speaks Swedish at home. A Norwegian-born husband has a Scotch-born wife; he has lived here for 45 years but both of them speak Norwegian at home. A Swiss husband has been here 31 years, and his Austrian wife for 28 years; they speak German as the fireside language. An Irishman married a Minneapolis-born girl whose father was born in France and whose mother was born in Germany. He speaks English at home, but she speaks German. In two out of three cases where a Swedish husband has a Norwegian wife, Swedish is spoken at home, but in the third case, the wife was dominant, and they have "compromised on Norwegian."

Thus, under the very favorable situation existing in Minneapolis and St. Paul, only from 20 to 25 percent of our immigrants have adopted English as the home language and more than one-half have not come to use English at home after living here for ten years or longer. The result of the foregoing study is to show that if this is true, the need for a new method of attacking the problem is manifest, or we shall have a growing tendency to continue the foreign language even to the later generations of the native born. The problem is probably not one primarily of the public school. Very probably it should fall rather under the general head of the problems of Americanization and of naturalization, and so rather become a social and legislative matter.

Legislative and other methods of insuring that English be the language of instruction in all schools will surely help to solve the problem, but the study sets forth clearly that there is a further need to be met. More carefully drawn naturalization laws will be in part effective. Equal suffrage, in bringing to many of the immigrant women the desire to acquire the rights of citizenship, will be in time a strong element in forcing many women to learn the new language. A changed attitude on the part of pastors and editors toward their foreign-born constituencies must also be effected. Sermons preached in English and local papers printed in English will have a powerful effect.

By way of summary, it may be said that if the condition pointed out in the above study is to be met effectively, it must be done by the development of a social consciousness on the part of the immigrant. He must learn that to be a good citizen of the new homeland he must speak English at home, attend sermons preached in English, and read papers printed in English. All of these things must be considered as a prerequisite to his ability to cast his ballot in an American election—a privilege which should stand to him as the crowning attribute of citizenship, the final proof of his complete assimilation as an American.

GROUP INTELLIGENCE TESTS AS A MEANS OF PROGNOSIS IN HIGH SCHOOL

I. N. MADSEN
State Normal School, Lewiston, Idaho

In this article data are submitted showing the possibilities of using the Alpha Army Intelligence Test as a means of prognosis in high school. This test was given to about one and a half million men in the army and became available for public use at the close of the war. It consists of eight sub-tests, and the maximum possible score is 212. The scores were interpreted by the army psychologists as follows:

Score	Rating	Interpretation
135–212	A	Very superior intelligence.
105–134	B	Superior intelligence.
75–104	C+	High average intelligence.
45– 74	C	Average intelligence.
25– 44	C−	Low average intelligence.
15– 24	D	Inferior intelligence.
0– 14	D−	Very inferior intelligence.

The conclusions of the present study are based on the results obtained from the high schools at Madison, Wisconsin; Rockford, Illinois; and Sioux City, Iowa; and from three high schools at Omaha, Nebraska, namely, Central, Commerce, and South. The test was given at Madison, Rockford, and Sioux City in May, 1919 and at Omaha during the second semester of the year 1919–1920. The total number of students taking the tests in these six high schools was 7,168, distributed as shown in Table I. The conclusions are summarized in the remaining tables.

According to Table II, which relates only to the results secured at Madison, Rockford, and Sioux City, only 8 students of the 3,703 tested fell below a score of 45 or "average intelligence." These eight were all in the freshman and sophomore classes. This indicates that more than average intelligence is necessary to enable students to enter these high schools. This agrees with the conclusions of Dr. Terman in his discussion of the "Significance of

TABLE I. THE NUMBER OF STUDENTS BY SCHOOL, CLASS, AND SEX ON WHICH THE STUDY IS BASED

	Madison	Rockford	Sioux City	Omaha			Total
				Central	Commerce	South	
Senior boys	62	111	69	128	63	22	455
Senior girls	103	149	141	152	82	47	674
Junior boys	80	166	88	151	97	28	610
Junior girls	141	183	162	190	147	46	869
Sophomore boys	121	186	135	184	133	33	792
Sophomore girls	175	182	192	235	217	49	1,050
Freshman boys	140	235	208	280	268	84	1,215
Freshman girls	174	265	235	331	379	119	1,503
Totals	996	1,477	1,230	1,651	1,386	428	7,168

TABLE II. SCORES OF THREE HIGH SCHOOLS (MADISON, ROCKFORD, AND SIOUX CITY) IN THE ARMY GROUP TEST ALPHA BY SEX AND CLASS

Score	Rating	Boys					Girls					Grand Total
		Senior	Junior	Sophomore	Freshman	Total	Senior	Junior	Sophomore	Freshman	Total	
135 and over	A	120	129	89	56	394	120	134	80	33	367	761
105–134	B	88	141	208	205	642	206	257	234	219	916	1,558
75–104	C+	30	60	119	258	457	63	92	207	323	685	1,152
45– 74	C	4	4	25	61	94	4	3	27	96	130	224
25– 44	C−	0	0	0	3	3	0	0	1	3	4	7
15– 24	D	0	0	1	0	1	0	0	0	0	0	1
0– 14	D−	0	0	0	0	0	0	0	0	0	0	0
Totals		242	334	442	583	1,601	393	486	549	674	2,102	3,703

Various Intelligence Quotients"[1] where he says, with reference to average intelligence in terms of the Stanford-Binet tests, that "the high school, however, does not fit their grade of intelligence as well as the elementary and grammar schools." The high-school students are thus seen to represent a relatively high grade of intelligence. From Table III it will be seen that selection of the mentally superior continues through the four years of high school. Thus, according to the medians, seniors stand higher than the juniors, the juniors surpass the sophomores, and the sophomores outrank the freshmen. This is true for the sexes separately as well as for the classes as a whole. This means that a large number of high-school students are eliminated because they lack the mental ability to meet the requirments of the work offered. How to provide for the individual capacities is, of course, a problem school administrators have worked on for many years. With the perfection of intelligence tests we may hope that the problems will become easier to solve through knowledge of the degree of intelligence required for success in the various types of school work.

TABLE III. COMPARISON OF MEDIAN SCORES IN THE ALPHA ARMY TEST IN SIX HIGH SCHOOLS BY SEX AND CLASS

	Madison	Rockford	Sioux City	Omaha		
				Central	Commerce	South
Senior boys	130.0	129.3	140.8	143.0	113.1	126.7
Senior girls	117.9	119.8	134.7	132.5	109.7	104.5
Whole class	121.2	123.8	137.6	135.0	110.8	110.0
Junior boys	124.0	124.6	136.2	134.0	108.0	118.8
Junior girls	121.4	112.2	128.0	130.5	97.8	117.8
Whole class	122.4	119.7	130.2	132.0	101.8	118.3
Sophomore boys	114.4	108.7	125.5	125.0	99.5	107.1
Sophomore girls	104.4	104.7	118.7	121.0	88.9	118.5
Whole class	109.7	107.0	122.1	122.0	93.8	113.6
Freshman boys	100.0	94.1	111.6	107.0	85.4	102.1
Freshman girls	93.0	89.8	105.0	107.0	84.0	87.5
Whole class	96.0	94.0	107.9	107.0	84.5	92.9

[1] Terman, Lewis M. *The intelligence of school children.* Boston: Houghton Mifflin Company, 1919.

It will also be observed that according to Table III significant differences appear in the median scores made by the students of the six high schools. In an earlier study,[2] the writer remarked on the superiority of scores made in the Sioux City high school over the Madison and Rockford scores. No satisfactory explanation was found. In this table striking differences are also shown between the three Omaha high schools: Central ranking first, South ranking second, and Commerce ranking third. In order to throw further light on this situation, the writer made a comparison of the occupations and nativity of the parents of the students of these three high schools. By "parent" is meant the father if living; the mother, if the father is dead; and the guardian if both parents are dead. The results appear in Tables IV and V. The occupations were classified in the following manner: (1) professional: artists, clergymen, engineers, lawyers, physicians and dentists, teachers; (2) business: bankers, builders and contractors, manufacturers, real estate; (3) public service: city, county, state, and other officials; (4) trades: bakers and confectioners, butchers, machinists, printers, etc.; (5) clerical: bookkeepers, salesmen, etc.; (6) personal services: agents, boarding housekeepers, hotel employees, housekeepers, milkmen, peddlers, seamstresses, street railway employees, etc.; (7) laborers: liverymen, teamsters, unskilled labor; (8) unclassified: occupations not given.

TABLE IV. COMPARISON OF OCCUPATION OF PARENTS OF THE STUDENTS OF THE OMAHA CENTRAL, SOUTH, AND COMMERCE HIGH SCHOOLS

	Central H. S.		Commerce H. S.		South H. S.	
	Number	Percent	Number	Percent	Number	Percent
Professional	226	11.1	43	3.8	33	6.0
Business men	754	35.6	274	23.0	116	20.4
Public service	74	3.5	47	4.0	14	2.5
Trades	227	11.1	228	19.2	32	6.0
Clerical	184	8.6	113	9.5	14	2.5
Personal	413	19.6	278	23.5	67	12.0
Laborers	48	2.5	93	8.0	88	16.1
Unclassified	169	8.0	118	9.0	192	34.5
Total	2,095	100.0	1,194	100.0	556	100.0

[2] Madsen, I. N. and Sylvester, R. H. "High school students' intelligence ratings according to the Alpha army test," *School and Society*, 10:407–10, October 4, 1919.

TABLE V. COMPARISON OF NATIVITY OF PARENTS OF THE STUDENTS OF THE OMAHA CENTRAL, SOUTH, AND COMMERCE HIGH SCHOOLS

	American Born		Foreign Born	
	Number	Percent	Number	Percent
Central High School.....	1,519	71	617	29
Commerce High School...	692	51	669	49
South High School.....	329	59	227	41

It will be seen from Table IV that there is a distinct difference in the constituency of the three high schools, Central High drawing more largely from the upper and middle classes, South High ranking second in this respect, and Commerce ranking last. Central is the oldest high school of the city and is of the classical type. Commerce, as the name indicates, provides training in commerce and other vocational courses. South High is the smallest of the three and is a cosmopolitan school but with about half of its students in commercial and vocational courses. From Table V it will be seen that there is also a distinct difference in the nativity of the parents of the students of the three schools, Central having the smallest proportion of foreign-born parents, South ranking second, and Commerce third. These facts again point to the serviceableness of the Army test as a measure of intelligence. There is substantial agreement between the intelligence scores of the high-school students and their social origin.

A very significant fact appears from Table VI, namely, the superiority of the younger students in each class over the older students in the same class. Thus the median score for the twelve-year-old freshmen is 125.0, for the thirteen-year-old freshmen, 109.7, etc., with a substantial and consistent decrease in score with increase in age to a score of 50.0 for the eighteen-year-old freshmen. The same fact holds for the other three classes. This is exactly what would be expected if the Alpha Army Test really measures native intelligence. Logically, one would expect a twelve-year-old who has reached the freshman class to be mentally superior to the older students in the same class. The difference cannot be due to educational experience for the twelve-year-old

TABLE VI. COMPARISON OF MEDIAN SCORES IN THE ALPHA ARMY TEST BY AGES AND BY CLASSES IN THE MADISON, ROCKFORD, AND SIOUX CITY HIGH SCHOOLS

	Age								
	12	13	14	15	16	17	18	19	20
Freshman	125.0	109.7	103.3	97.2	90.3	87.0	50.0	.....	.....
Sophomore	.....	125.0	121.9	114.4	113.3	103.7	105.0	95.0	.....
Junior	.....	.....	130.0	128.7	127.3	121.5	114.1	100.0	.....
Senior	.....	.....	.....	145.0	141.4	130.3	125.8	117.8	107.5

TABLE VII. CORRELATION OF INTELLIGENCE WITH SCHOOL MARKS IN THE SOUTH OMAHA HIGH SCHOOL

	r	Number of Students
Freshman boys	0.27	84
Freshman girls	0.37	119
Sophomore boys	0.42	33
Sophomore girls	0.36	49
Junior boys	0.38	28
Junior girls	0.50	46
Senior boys	0.51	22
Senior girls	0.36	47

has ordinarily not been in school as long as his older classmates. The likelihood is much stronger that the reverse is true. The older freshman has also the advantage of more years in which to secure incidental information, which should help him in making a high score if educational experience is a factor. Another significant fact appearing from Table VI is that for any given age there is an increase in score by the sophomores over the freshmen, by the juniors over the sophomores, and by the seniors over the juniors. For example, for age fifteen, the median score of the freshmen is 97.2; of the sophomores, 114.4; of the juniors, 128.7; and of the seniors, 145.0. This also accords with the logic of the situation.

If the Army test really measures intelligence, then for a given age, the students in the higher classes would secure the highest scores.

Table VII shows the correlation of intelligence with school marks. The school marks were obtained from South High School by taking the average of each student's marks at the end of the first semester, 1919–1920. Pearson's formula was used for finding the coefficients of correlation. It will be seen that the correlations are all positive and large enough to be significant. Several reasons may be given why they are not larger. In the first place, the inaccuracy of school marks as shown by recent investigations would reduce the correlations below their true value. A second cause is the shifting standard of marking. The standard tends to be too high where intelligence is unusually high and too low where it is unusually low. This is inevitably the case where marking is based on the normal distribution curve for the particular school.

TABLE VIII. NUMBER OF SUBJECTS CARRIED BY SOUTH HIGH-SCHOOL STUDENTS WHO BELONGED TO THE LOWEST AND HIGHEST QUARTERS OF THEIR CLASSES (ACCORDING TO THE ARMY TEST)

Subject	Taken by Freshmen		Taken by Sophomores, Juniors, and Seniors	
	Highest Quarter	Lowest Quarter	Highest Quarter	Lowest Quarter
English	50	40	42	39
French	6	4	9	2
History	22	14	16	21
Latin	19	7	21	11
Mathematics	20	9	16	17
Spanish	7	1	2	0
Penmanship and spelling	22	34	.....	.....
Physics	.....	.....	14	9
Reviews	.....	.....	5	10
Shorthand	.....	.....	12	14
Typewriting	.....	.....	19	27
Chemistry	.....	.....	7	3
Cooking	.....	.....	7	11
Commercial arithmetic	.....	.....	10	15

Table VIII also indicates a correlation between intelligence and school work. The question occurred to us whether there would be any differences in subjects chosen by the students scoring high and those scoring low in the army test. To determine this, the students scoring above the upper quartile and those scoring below the lower quartile were compared. For this purpose the students of South High were used. The freshman class was scored separately and the three upper classes were combined because of the smallness of their numbers. In the freshman class there were 50 students (21 boys and 29 girls) in the highest quarter of the class, and of course the same number in the lowest quarter. In the three upper classes there were 60 students (25 boys and 35 girls) in the superior group and also in the inferior group. There appears to be a marked tendency for the superior group in both cases to select the subjects usually considered "hard," and for the inferior group to select vocational or prevocational subjects. This tendency is prevented from full expression by certain fixed requirements and by the lack of "sophistication" among the students. How shall we interpret these facts? Does intelligence tend to seek its proper level? Do the mentally superior select the more academic subjects because they find them mentally "stimulating" or because of college and professional preparation?

Persistent and important sex differences are found in scores made in the Army mental tests. In every one of the six high schools, the median score for boys in each class was higher than the median score for girls in the same class. (See Table III.) This sex difference has also been found consistently in universities where the test has been given. Two reasons have been proposed for this difference: first, that the boys are really mentally superior, and second, that the Army test is a "man's test." The latter reason has been asserted particularly with reference to Test 8. This is a test of general information; and it appears to be more within the range of the interests of men than of women. In order to determine the extent to which each of the eight tests contributed to the differences in total scores, the median score for each test and for the boys and girls of each class at the High School of Commerce was found. The results appear in Table IX.

In connection with this table the reader's attention is called to the following titles or descriptions of these eight tests:

1. Comprehending and carrying out directions
2. Arithmetical problems
3. A test of common sense
4. Opposites test
5. Disarranged sentences
6. Number completion test
7. Judgment of relationship
8. General information test

From Table IX it appears that the greatest difference was in Test 8. The boys, however, surpassed the girls to some extent in every test except the fifth (disarranged sentences). Although the boys did better than the girls in the Army test, it appears from Table X that the girls in each class had the highest school marks. It is quite possible that certain emotional traits resulting in greater docility enable the girls to secure better marks on a smaller mental capital than the boys need. These emotional traits need not be elaborated upon here since they are familiar to teachers and educational students through educational psychology.

TABLE IX. SEX DIFFERENCES IN TESTS 1 TO 8 OF THE ALPHA ARMY TEST IN THE OMAHA HIGH SCHOOL OF COMMERCE (MEDIAN SCORES)

Class and Sex	Test								Number of Students
	1	2	3	4	5	6	7	8	
Freshman boys	9	10	9	12	8	8.5	13	18	268
Freshman girls	7	9	8	11	10	8	14	16	379
Sophomore boys	9	11	9	14	11	10	18	22	133
Sophomore girls	8	9	9	13	10	9	16	18	217
Junior boys	9	12	10	15	11	10	16	23.5	94
Junior girls	7	9	10	14	12	9	16.5	21	147
Seniors boys	8	12	10	18	12	10	19	26	63
Senior girls	8	9	11	18	14	10	19	22	82

TABLE X. COMPARISON OF MEDIAN SCORES IN INTELLIGENCE AND IN SCHOOL MARKS IN THE SOUTH OMAHA HIGH SCHOOL

Class and Sex	Intelligence Scores	School Marks
Freshman boys	102.1	77.5
Freshman girls	87.5	83.3
Sophomore boys	107.1	80.3
Sophomore girls	118.5	86.0
Junior boys	118.7	82.5
Junior girls	117.8	86.6
Senior boys	126.7	86.9
Senior girls	104.5	85.5

To conclude, the present study may be summarized as follows:

1. High-school students are a highly selected group mentally compared with the general population. "Average intelligence," as defined by the army psychologists, was the lowest grade of intelligence in the high schools investigated.

2. Selection by elimination of the mentally inferior continued throughout the four years of high school.

3. In each class the younger students were superior mentally to the older students; and accordingly, at a given age, students in upper classes were superior mentally to those in lower classes.

4. Students whose parents were in the "higher" and more remunerative occupations and were of American nativity were mentally superior to students whose parents followed the more undesirable occupations and were of foreign nativity.

5. The correlation of mentality with school marks was positive.

6. There was a difference in the subjects of study elected by the mentally superior and the mentally inferior.

7. Sex differences were indicated by a higher median intelligence score for the boys than for the girls.

8. In each class the girls, in spite of lower intelligence scores, had higher school marks than did the boys.

To the writer, it seems that facts like these should help high-school principals in their problems of prognosis and guidance. The group intelligence test does not, of course, displace other means of doing this. However, it provides a quick and serviceable way of getting at one of the most important factors in the success of a student in his school work, namely, his intelligence.

AN EXPERIMENT IN ARRANGING HIGH-SCHOOL SECTIONS ON THE BASIS OF GENERAL ABILITY

ERNEST P. BRANSON
Supervisor, Department of Research, Long Beach City Schools, Long Beach, California

In October and November, 1919, some nine hundred pupils in the eighth grades of the Long Beach, California schools were tested with the Otis Group Intelligence Scale. Since half of these pupils were to enter high school the following February, it was decided to select in advance two classes in high-school English partly on the basis of the test scores. These two high-school sections will be known as Sections A and D. Section A was composed of those younger pupils whose Otis scores were high. Section D was composed of those older pupils whose Otis scores were low. The average age in Section A was 13.6 years; in Section D, 14.7 years. The average score in Section A was 143.5; in Section D, 93.5.

Both sections were given to the same teacher without any hint as to difference in ability. In less than a week the teacher had noticed it and had reported it to the head of the department and to the vocational adviser. Since we had previously agreed to wait until the teacher showed that she was aware of the difference before revealing that an experiment was in progress; it was now time to take the teacher into our confidence. At the end of the second week in the high school each of the two groups was tested with the Holley Sentence Vocabulary Scale, Series 3B. The teacher was told to proceed with the work of the term, adapting it to the capacity of each section according to her judgment.

At the end of the term the same test was given again without announcement in advance. The test is one of general language ability and correlates well with general intelligence. It consists of the words embodied in incomplete sentences, which are to be filled out by the choice of one of four suggested words.

In the teacher's opinion the groups were better social groups because of the similarity of ability. Instruction was easier than it would have been if the groups had been mixed. Indeed the only difficulty in instruction lay with the poorer class; and this was largely because the teacher lacked definite knowledge as to how much she could change the course of study and yet make it

possible for these pupils to take regular work in later terms. The effect on individuals was good, some in the better section making their first apparent effort. The teacher could judge on this point as she had previously been the departmental English teacher of a number of them. The brighter ones when matched with their equals apparently found effort worth while. It may be pointed out here that the usual class contains enough average and dull pupils to quench the fire of some who possess unusual ability.

In Section D, fourteen pupils were present throughout the experiment. All of these had been assigned in accordance with the teacher's judgment. In Section A, twenty-two pupils were present for the entire period. The teacher felt that three of them had not been satisfactorily assigned. One was a somewhat retarded pupil; the other two were suspected of being temperamentally unfitted for successful school work. The test results confirm the suspicion. Each section contained other misfit pupils who were assigned to these sections by the exigency of crowded rooms, not as part of the experiment.

The assignments on the basis of test results were more satisfactory in the case of the poorer section, despite the fact that a poor score may be due to an accidental factor such as illness or fatigue. The assignments to the better section were not quite as satisfactory to the teacher, though the high scores of pupils in this section could hardly be due to an accidental factor.

But why did these pupils of apparently superior ability fail to take hold of the work as well as the rest of the section? This question is related to one that appears when the results of the first and second vocabulary tests are compared. The losses in the scores of individuals are most noticeable in the case of those who made very high scores the first time. It seems that the superior pupils were less dependable in school routine. The first test was a novelty; and they did their best. The second time a little less effort lowered the scores a bit. The Pearson coefficients of correlation confirm this view. The correlation between the first and second tests was 0.85 for Section D and 0.67 for Section A.

While rating presented no problem in Section A, in Section D grades were given as follows: 1 student received A; 3 students received C; 10 students received C—; 5 students received D. "C—" means credit granted on condition. The condition for these

RESULTS AS SHOWN BY THE HOLLEY SENTENCE VOCABULARY SCALE

Section	Medians		Lowest Score		Highest Score		Correlations	
	First Test	Second Test	First Test	Second Test	First Test	Second Test	First and Second Vocabulary Test	Otis and First Vocabulary Test
D	48	49.5	33	38	66	64	0.85	0.30
A	63	66.5	47	55	79	79	0.67	0.41

pupils was that they enroll in a designated section for the next semester, Section D being held together in this way. This solution of the granting of credit for the necessarily inferior work done and this method of holding the class together is not wholly satisfactory, but it is the best upon which the teacher, head of the department, vocational adviser, and registrar found themselves in agreement. The principal of the high school humanely insists that it is wrong to put the C— stigma on the efforts of these pupils. They should be saved that sense of failure.

Any estimate of the results of this experiment is a happy one compared with what must have happened to these pupils if scattered throughout the school. All the weaker pupils must surely have failed; discouragement would have caused them to leave school in most cases, for that is the history of poor ability—quick elimination from opportunity. As for Section A, the intellectual leadership of the next generation depends on giving the widest opportunity for development to those best fitted to lead.

Two thoughts occur to us as a result of our experience with these classes. First, the course of study should be examined with the needs of weak classes in mind. Definite modifications in subject matter and method should be made in order to fit a course of study to the needs and capacities of this group. Second, the granting of credits and the system of credit bookkeeping and program planning should be made as elastic as possible in order to aid these pupils to remain in school without the sense of failure. To do one's best is not failure.

Editorials

THINGS WE DO NOT KNOW

Nothing is better calculated to engender humility of spirit than conducting a reference department in an educational office. The Bureau of Educational Research of the University of Illinois has been offering this service; and the school people have proposed all sorts of questions, problems, and perplexities. Indeed, if we could give a corporate existence to the school people, we should say that they differ from the small boy when he cuts loose on his bewildered father only by being "more so." For example, Mary Smith—this is no *nom de plume*—wrote, "Will you please tell me how to make the teaching of Caesar more interesting?" At this juncture we were inclined to resign. So far as we are aware, the teaching of Caesar is not only uninteresting but intentionally, avowedly, and blatantly so. Its uninteresting character is indeed its alleged virtue. Nevertheless, we took the request quite seriously and so gladdened Mary's heart that her colleague, Alice, in the history department promptly wrote for "any information in regard to supplementary material for a high-school course in ancient history." Six months later Alice again appeared on the scene, this time as a geometry teacher, but with the same childlike faith in our omniscience.

Not exactly easy is the topic sent us by a committeeman who in a moment of weakness had evidently agreed to report to some organization on "Curriculum Reconstruction Due to the War." He passed the task on to us without subdivision or modification. Now, the curriculum without reference either to war or to reconstruction is sufficiently baffling. But as a problem for realignment because of the conditions and results of the world conflict, it becomes a quagmire crossed here and there by prints of human feet but devoid of paths which lead anywhere in particular.

But perhaps we were never more completely overestimated than when we received from the president of a woman's club a request for material on "The World: Its Problems and Its Progress"—all on a postal card. Considering the fact that this interesting proposal arrived when the world was decidedly wabbly and its progress altogether problematical, our correspondent has probably forgiven us for withholding complete information on her timely topic.

But not all the topics, nor indeed very many of them, have such an impossible scope. Some others, however, although they may be more precise and have greater dignity as practical questions, are nevertheless elusive. Not a few of them would make admirable topics for dissertations. For example, one writes, "We are to build a new community high-school building. We shall have $100,000 to spend and shall need to provide for two hundred students in the future. We want plans of new buildings, lists of equipment, etc. We expect to provide courses in academic subjects, agriculture, domestic science, manual training, the sciences (biological, physical, and chemical), and commercial subjects. We also ought to have a gymnasium and if possible a swimming pool." The writer adds with sudden realization of the high cost of building, "We are probably too ambitious for our purse." Nevertheless, he has a definite problem; and he has done some thinking for himself. He states the conditions with clearness and vigor.

Again, a school board member, who is also a physician, writes: "Can you send me something in print which deals with the general subject of daylight illumination, particularly the questions of the proper amount (ideal, maximum, and minimum) of light to reach the child's school book, character, quality, and direction of source considered, also some information as to the amount of light reaching northern Illinois from the sky, direct sun rays not considered, both in clear and cloudy weather through the winter season?" This again is a topic of specific, practical character. It is also a topic concerning which we have little satisfactory information. Such a topic might engage the earnest and prolonged attention of students of physics and meteorology as well as of education.

The topics we have mentioned are incapable of being answered in the present state of our knowledge. Whether they are thoughtfully or uncritically expressed, they rest upon assumptions as to the availability of data which are not justified. Ways of making the teaching of Caesar more interesting are not matters of record. Successful teachers seldom leave behind them any footprints in the sands of pedagogy. Curriculum reconstruction can only be undertaken with great labor by many people working on a common problem from various points of view. Specifications for buildings and precise data on illumination have not been gathered in suffi-

ciently authentic detail to be helpful. We do not assert that these questions are either frivolous or impossible. The answers to them, however, are not at present in existence. They involve for their solution long and painstaking investigation and the cooperation of students in several fields of knowledge.

But other questions are received which are definite, practical, and obviously worth while. Yet in many cases answers to these questions are likewise unobtainable. For example, "Do you know of any standard of expenditures for school purposes, that is, whether or not anyone has estimated or determined what percent ought to be expended by school authorities for the various items under the topics of *general control, instruction, operating plant, maintenance,* . . . in the present system of accounting used by federal and state departments?" To obtain such facts for school systems of different sizes would require nothing more than the clerical service necessary to combine figures obtained from systems using the approved classification of accounts. Not only superintendents and boards of education but also the general public would be interested in knowing what they might be expected to expend for libraries, promotion of health, teachers' salaries, etc. in order to be up to the standard in such matters.

Another correspondent asks, "What is the standard rate of attendance?" This is apparently a simple question. All we need to do is to consult the reports of superintendents for the attendance rates in different localities, and by summarizing these we may arrive at a notion of the usual rate. As a matter of fact, however, there is no good answer to this question. It is one of the things we ought to know but do not.

Again, a superintendent wants to know the typical amount of retardation in cities of 100,000 or more. Another, thinking along the same line, wants to know the ages of eighth-grade graduates and of high-school graduates. Still another writes to ask what has been done to determine "what might be termed 'the legitimate percent of failures' among high-school pupils."

Perhaps we have said enough to indicate why we are humble. Although not all the questions we receive are worthy, far the greater part of them represent a real need on the part of somebody. Moreover, many of them are relatively simple; yet a surprisingly large number cannot be answered convincingly. Among the

subjects of masters' and doctors' theses, of educational monographs and articles, we do not find enough of the problems which are really confronting teachers, supervisors, and administrators. It would be infinitely to the advantage of educational inquiry if topics for research showed a closer relationship to the actual needs of the school. The fact that they do not—the fact that those who know the concrete problems are not doing the educational writing while too often those who write do not appreciate the problems—accounts for the astonishingly large number of *things we do not know*.

B. R. B.

EDUCATIONAL RESEARCH BY MEMBERS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

In the August (1920) number of the *Psychological Bulletin* Dr. Boring, secretary of the American Psychological Association, summarizes statistics on the research fields in which 393 members of the association report themselves to be working. The statistics include all the members of the association except a few who failed to report on this item. A member who reported two or more fields was accredited fractionally to each of the fields, which accounts for the fractions in the figures given below. Of the 393 reporting, 53 are carrying on no research. The remaining 340 are classified as follows in Table VI of Dr. Boring's article:

Field of Research	Number Accredited	
I. Non-psychological Fields		
1. Philosophy	15.7	
2. Aesthetics	1.7	
3. Anthropology	2.6	
	Total 20.0	or 5.9%
II. Chiefly Pure Psychology		
4. General psychology	8.7	
5. Experimental psychology	81.6	
6. Theoretical psychology	37.4	
7. Animal psychology	15.5	
8. Psychology and neurology	4.2	
	Total 147.4	or 43.4%

III. Social and Industrial Psychology		
9. Social psychology	6.1	
10. "Applied" psychology	10.7	
11. Industrial psychology	7.4	
	Total 24.2	or 7.1%
IV. Chiefly Education		
12. Tests	54.2	
13. Educational psychology	43.9	
14. Education (including experimental pedagogy)	13.2	
15. Clinical psychology	13.7	
16. Statistical method	1.2	
	Total 126.2	or 37.1%
V. Psychopathology		
17. Abnormal psychology	7.2	
18. Psychiatry	2.5	
19. Psychopathology	7.0	
	Total 16.7	or 4.9%
VI. Miscellaneous	5.0	or 1.5%
Grand Total	339.5	or 99.9%

Although a classification like that attempted by Dr. Boring cannot be free from certain ambiguities, two important facts are tentatively established by his data:

1. When we combine the figures for the three fields of applied psychology (education, psychopathology, and social and industrial psychology) it is seen that this group accounts for 167.1 of the 340, which is 49.1 percent of the total number.

2. Approximately 37 percent of the 340 members of the American Psychological Association who are doing research work are accredited to the field of education. Surely the future of the JOURNAL OF EDUCATIONAL RESEARCH ought to be assured.

L. M. T.

A BOOK OF CASES

In their educational reading teachers are looking for things they can use. No doubt they often give too narrow an interpretation to the term useful, and we observe that, actuated by this impulse, they are subscribing in enormous numbers for periodicals devoted to devices most of which are shallow and inconsequential. Nevertheless this demand for things that will work has its meaning for investigators. It raises the question of a worthy substitute for the mere device.

To be more specific, we note that in connection with testing programs there has been some disappointment because the superintendent or the research director has so frequently failed to follow up the testing with a campaign of betterment. This has meant that many of the lessons of the testing have been lost. High hopes, entertained when the testing was begun, have not always been realized. In casting about for something concrete and vital to say to teachers on the procedure to be followed as a result of testing, we have become convinced that the form of reporting may be improved.

We commonly present our material in tables; and these tables constitute the framework of our discussion. Yet individual cases are entirely lost in tabular statements, unless the tables are very detailed—and in that case they are usually too long to print. A table of the usual type may indicate, for example, the number of ten-year-old children belonging to the fifth grade and having scores of 7 in addition, 40 in handwriting, etc. Such a table, however, does not permit us to express the characteristics and achievements of separate individuals. We cannot be sure that a single child actually exemplified in himself the conditions we have mentioned. A table, to the extent that it is a summary—and almost all printed tables are summaries—offers little upon which detailed practice can be based. Neither do the articles which are written around such tables. They are of general but rarely of specific application.

We, therefore, suggest as an especially useful type of material for the guidance of teachers the detailed reporting of cases. A "case" is a child with his recorded characteristics, antecedents, and achievements—a child who is attending school and who necessarily presents at various points in his school career problems which are met by some sort of procedure. The report of a case is

merely a descriptive and narrative biography of the child in question as he proceeds through school. It has something to say about his family and his personal traits, but more especially it is devoted to a chronicle of what was done by him and the teacher (or other official) and of what resulted from the action taken.

Our effort to secure practical data has forced us to the conclusion that far more useful than cheap devices and quite as dignified as most of our research would be a collection of reports of such cases, properly classified and indexed. In the practice of law this is precisely what is done. Good law is simply a case which applies to the matter in hand. Wigmore *on evidence* or Williston *on contracts* or any one of the various encyclopedias of law are essentially citations of cases, classified and indexed so that they can be applied to aid in the determination of almost any question.

The analogy between school cases, and court cases cannot, of course, be pressed too far. The legal case is more than a statement of conditions as revealed by the evidence. It also involves a decision by an authority of competent jurisdiction. Indeed the whole body of legal doctrine is based upon decisions rendered in actions before courts constituted for the express purpose of making decisions. The essence of the legal case, therefore, resides in the fact that something is decided. The school case, however, does not appear in an institution whose chief purpose is to render decisions. The school does other things, and when it makes a ruling, its ruling is by no means above dispute. Yet even in school the means are becoming available for reaching decisions—not merely decisions by constituted authority but decisions based upon impersonal standards whose applicability cannot easily be questioned. It is clear, therefore, that given the machinery for transmitting accounts of the cases and of the decisions rendered in them, a body of educational doctrine may be built up for the guidance of practitioners.

If, for example, we had as a beginning a thousand well-established and typical case reports, in each of which the salient facts about a child were given with the different crises that arose in his school career and the measures that were taken to meet them, we should no doubt have a body of material which in richness and in utility for schoolroom practice would quite exceed that of any book which has ever been published. This "Book of a Thousand Cases" would be a *vade mecum* for every teacher. In it would be

found the means by which resourceful teachers have coped with the difficulties of their craft. For there are really few if any new problems in teaching. There are new phases of old problems, but it is scarcely thinkable that at this late day any really new crux ever appears in a schoolroom. The overgrown and backward child, the child who is shy, the child who has a special disability in mathematics, the sullen and the sunny, the honest and the dishonest, the leader and the follower—all these have been attending school time out of mind. They have been coaxed or cudgled, stimulated or repressed, punished or rewarded. The point, however, is that the inexperienced teacher must meet all these conditions as if they had never existed before. To her the experience of her predecessors is nothing. She must tread the same path that others have trod, meet the same difficulties that others have met, fail or succeed for the same reasons that have influenced thousands of others. She has no guidance from them, no friendly lessons of caution from their mistakes, no inspiration from their successes.

Of course, one reason why there is little available concrete material of the sort which we have in mind is because the school, unlike the courts, have no systematic means of record-making. Most of our actions leave no deposit; and if any record is made of them, it is only for temporary use. As soon as it has served its immediate purpose, it is discarded and lost. For example, most teachers appear never to realize that they themselves—to say nothing of others—could make good use next year of the examination questions they make out this year. Very few teachers of our acquaintance have been able to give any intelligent estimate of the abilities of children one year as compared with another because their methods of testing pupils have passed out of their minds and have been unrecorded from year to year.

The case book of which we are speaking, the book which will will bring concrete situations before the teachers who can profit by them, will rest for its publication upon systematic record-making in the classroom and school office—record-making which is a little burdensome, a little tedious, and altogether uninspiring. We venture to believe, however, that if this record-making could be developed even in a few centers, and if the first case book, edited, interpreted, classified, indexed, and cross-referenced. could once appear, it would justify by its usefulness every effort through which it was produced.

B. R. B.

Reviews and Abstracts

E. H. Cameron, *Editor*

Arithmetic: report of progress. Duluth Public Schools, 1919.

The above report represents the course of study in arithmetic in the public schools in the city of Duluth. It was introduced in September 1919, having been constructed during the previous school year through the combined effort of teachers, principals and supervisors in the public schools and of representatives of the State Normal School of Duluth. While the principals, supervisors, and representatives from the normal schools were responsible for formulating the general principles underlying the course of study, much of the actual selection of the subject matter to be taught and its arrangement in the course of study represents the work of the teachers themselves. In fact, the contribution which the teachers have evidently made is one of the distinctive features of the report.

The report begins with a concise statement of the aims to be accomplished and the attitudes to be developed through the teaching of arithmetic—statements reflecting the social values in education. The brief outline of the subject matter composing the next portion of the report is the direct outcome of emphasizing the following aims: (1) to enable one to do the ordinary computing required in common business; (2) to give arithmetical knowledge that fits into the real situations of home, shop, farm or business; (3) to acquaint pupils with the simplest methods used in business. At all times the subject matter has been chosen upon the basis of the social and individual needs of the child.

After a brief survey of the subject matter of the course, comes another distinctive feature of the report—one usually lacking in courses of study—namely, a statement of general directions for classroom procedure and a discussion of the underlying principles in such procedure. This section of the report is very specific and suggests to the teacher just what to do in minute detail. These directions and principles contain almost all the scientifically established facts. Indeed, the section includes a quotation from "Principles of Method in Teaching Arithmetic as Derived from Scientific Investigation" in the *Eighteenth Yearbook of the National Society for the Study of Education*. The section closes with a brief discussion of the various standardized tests in arithmetic, giving a description of the tests and the standards of achievement.

The next section of the report is a detailed statement of the work of each grade, with special emphasis on the following heads: directions, subject matter and projects, optional work, standards of attainment and bibliography. Three things deserve special mention in this section. (1) The explicit directions suggesting to the teacher the proper method for dealing with the commonly overlooked things in teaching; (2) the elaborate description of a major project and a suggested list of minor projects. This portion of the report is in keeping with best educational thought and should be welcomed by all teachers interested in project teaching; (3) the detailed bibliography referring the teachers to the exact chapters which deal with the problems peculiar to the particular grade. The report closes with a well-selected bibliography on various aspects of the teaching of arithmetic.

In general this report represents the embodiment of our best modern theories of education and the inculcation of the best scientifically established principles. It is more than a course of study. It is an outline of methods as well—such a combination being made possible through the cooperation of specialists, administrators, and teachers. Other cities could well follow the example of Duluth. C. W.

Arithmetic survey in the public schools of Newark, N. J. Newark, New Jersey: Board of Education, December 1919.

This report presents the results of a survey of arithmetic in the Newark public schools, conducted in 1919 under the direction of Mr. Elmer K. Sexton, assistant superintendent in charge of the Department of Reference and Research. In this survey, the Woody Scales, Series B, and the Stone Reasoning Test were given. The giving of these tests and the scoring of the results deviate somewhat from the usual practice followed in surveys in that a teacher was sent to each school (in no case the school where she regularly taught) to give all the tests in that school and in that the test papers were scored by the staff of the Department of Reference and Research.

The reports set forth comparisons of results attained in Newark with those attained in other cities, comparisons of the achievements in various schools in Newark, comparisons of achievements of specialized groups of children, e.g., Italian and Hebrew children, children from prosperous American parents and those from less prosperous American parents, etc. The later sections of the report deal with the analysis of errors.

The most significant conclusions are:

1. The children of Newark surpass the Woody standards in all grades below VA and fail to attain the standards in the higher grades. In this connection it should be said that recent investigations indicate that the original Woody standards upon which these comparisons are made are low in the lower grades.

2. The children of Newark make a high record in the Stone test, but not as high as the children of Salt Lake City.

3. That there is a high correlation between the scores attained in the fundamentals and in the reasoning problems. This correlation was not calculated and seems to be based upon class scores rather than upon scores of the individual pupils.

4. The Hebrew children surpass all others in the fundamentals but are excelled by the Americans in reasoning.

5. There is no significant difference between the results achieved by the children from the more prosperous and the less prosperous homes.

The report is very carefully worked out and should be very helpful to teachers and supervisors. It should be welcomed by those who have had little experience in testing for it represents the proper method of dealing with test results to make the measurements most worth while. It appears that the report would be more easily interpreted if there had been a greater utilization of graphic presentation.

C. W.

Bartholomew, W. E. and Hurlburt, Floyd. *The business man's English.* New York: Macmillan Company, 1920. 340 pp.

This book forms an excellent introduction to the very many problems that arise in the use of English in business. It is in fact a course in business letter writing with several introductory chapters on matters of correct and effective English and with

some supplementary chapters on office practice, report writing, proof reading, and the like. The subject matter is authoritative and up-to-date, a first essential when one is dealing with such a changing thing as business practice. A great wealth of material is presented with striking conciseness, and yet with such an abundance of exercises that the classroom teacher will find the book a practical text. Every effort has apparently been made to make the sections on errors and correctness of English just as practical as possible, and in this respect the book is clearly superior to some recent texts on "applied" English. Such a book as this in high school furnishes a practical outlook that is the best and most powerful incentive for composition work, and it will be welcomed by teachers who are eager for better results in this direction. Of course, in any book which tries to cover an immense field, there is an inevitable loss of emphasis on what many would feel to be the more essential matters. This defect, however, any teacher can easily remedy simply by passing over certain parts and putting more time on others.

University of Illinois E. W. DOLCH

HILL, DAVID SPENCE. *Introduction to vocational education.* New York: Macmillan Company, 1920. 475 pp.

In this volume Dr. Hill has done what needed very much to be done. He has brought together widely varying data and materials from widely diverse fields and has organized them into a study of vocational education.

A glance at the table of contents reveals an unusual breadth of treatment running all the way from "Safeguarding American Democracy" in chapter I, and "Adjustments to Individual and Society" in chapter III, through "Education for Mechanical Trades and Industries" in chapters VIII and IX, to "Applications of Psychology to Instruction and Industry" in the thirteenth and last chapter.

The author has very wisely incorporated the Smith-Hughes Act and the Smith-Sears Act in their entirety in the Appendix.

Following each chapter is a very complete list of references selected with discrimination and with full appreciation of the needs of that particular chapter.

The book will make its chief contribution as a reference for libraries, as a help to students of education, and as a source of information to the lay reader who is interested in the newer phases of the modern school.

University of Illinois S. J. VAUGHN

MACKIE, RANSOM A. *Education during adolescence.* New York: E. P. Dutton and Company, 1920. 189 pp.

This volume, as the author freely acknowledges, is based upon the work of G. Stanley Hall. Some seventy different citations to Dr. Hall's writings are made in support of the theses presented. A plea is made for the junior high school, the elective principle in secondary education with a definite leaning toward vocationalism, a certain irreducible number of constants—English, social studies, history—and a new procedure along the lines of the socialized recitation. The book contains copious quotations from exponents of the principles of self-activity as opposed to a lifeless formalism and uniformity in educational practice. Typical curricula for the junior and senior high schools are discussed.

The author, being an ardent disciple of Dr. Hall, accepts without question and with enthusiasm the theory of saltatory development. Upon this hypothesis is worked out

an argument for the junior high school. Those who urge the theory of gradual development would be inclined, no doubt, to challenge a program that would impose upon later childhood a school in which the pupils: (1) "Need much drill, habituation, authority, and memory work;" and then suddenly offer a school for pre-adolescents (12 to 15) in which pupils are to have a "New Freedom" because (2) "As adolescence slowly supervenes and boyhood is molted, the method of freedom and appeal to interest and spontaneity should be increased. If there is any genius or talent, enthusiasm for work or ideals, they begin to be felt." (Cited by the author as a basic principle from Dr. Hall's *Youth: Its Education, Regimen and Hygiene*, p. 359.)

The striking thing in this contrast is not the desirability of the new school with its new procedure for the junior high-school boys and girls, designed to *release* personality and *unfold* individuality under freedom regulated by law, but rather in the denial of a similar emancipating program for later childhood, or for that matter, any other administrative unit in the whole range of education. It does not seem to be a valid or valuable theory of education that would restrict one period of education (whether later childhood or that of college after the high school) by imposing a rigid formalism—a memorizing, lesson-hearing school, and then attempt to find a "Path to Freedom" in some subsequent period. Pupils of later childhood may be so badly corrupted in the lesson-hearing school that a procedure for *releasing* personality cannot be economically and productively developed in the subsequent period.

Another major criticism is offered not because the author does not make a good case for a certain group of "constants" in secondary education—English, social studies, history—but rather because he, in common with a number of writers, is failing to give proper emphasis to other major fields of secondary education, particularly science and mathematics, as basic work for all pupils in our secondary schools. Certainly the technic of our modern civilization is science. The tools of science are comparatively new. In order to understand and appreciate the problems of our modern life, and in order to build our civilization—socially, economically, nationally, internationally—the people of a democracy must be familiarized with the tools and the method of science. There is abundant argument to support the view that science should be a universally known and appreciated as the English language itself. It is not enough to say that only a limited number of trained experts will be required. There is no way of selecting them in advance of the experiment. Moreover the common man needs to know what his specialist is about, and to appreciate expert and trained leadership. Science, including mathematics, is a definite and an invaluable contribution toward a common knowledge and toward a general appreciation of American life.

The proper development of the physical sciences requires secondary school mathematics. No "hit and miss" election of such an important subject can be defended.

With a rational development of the project method, and socialized procedure, the constructive arts may gain a commanding emphasis in the secondary school among the "constants." At all events, it does not seem wise to foster a dogmatic or limited view of any irreducible minimum. The tendency to emphasize a few common courses of studies is a definite reaction against a growing practice of loose and uncoordinated election.

The author reflects the well-known attitude of Dr. Hall toward the foreign languages, particularly the classical group.

As a whole, this volume is a stimulating challenge. Material of current interest is assembled and the writer defends his theses with enthusiasm.

H. L. MILLER

University High School,
Madison, Wisconsin

Bibliographies

SELECTING A PLAY

DRAMA LEAGUE OF AMERICA. *List of plays for high school and college production, edited by committees from the Drama League and the National Council of Teachers of English.* Washington, D. C. (306 Riggs Building): Drama League of America, 1916.

DRURY, F. K. W. *Some of the best dramas.* New York: H. W. Wilson Company, 1917.
This list consists of plays which have been acceptable as acting drama in their own age. There are also many other bits of advice included. It will not only be useful in the selection of a play but may be useful in classes in English.

HILL, FREDERICK T. *High school farces.* New York: Frederick A. Stokes, 1920.

JOHNSON, GERTRUDE E. *Choosing a play.* New York: Century Company, 1920.
This is probably the best book published on the subject.
Part I of the book takes up the problems of the theater as an educational institution, dramatic production and the educational curriculum, why the one-act play, dramatics in the high school, the place of pageantry in community life, notes on acting, material for production.
Part II gives the addresses of play publishers and brokers, lists of plays (graded), Christmas plays, plays for women actors, one-act plays in pamphlet form, one-act plays for male characters, books of one-act plays, plays possible for out-door production, plays for study and scene work, books of plays for children, other bibliographical lists, magazines and periodicals of assistance, books and articles on pageantry, books and articles on dramatization in school work, and books about the theater and acting.

KAPLAN, SAMUEL. *Actable one-act plays.* Chicago: Chicago Public Library, 1916.

MERRY, GLENN N. *High school plays. A compilation of data concerning plays recently presented in Iowa schools.* (State University of Iowa, Extension Division Bulletin No. 18.) Iowa City, Ia.: State University of Iowa, 1916.
This bulletin opens with an introduction telling how the list of plays was obtained, cost of plays, etc.; but most important is the list of plays which follows the introduction. For each play is given the title, author, publisher, classification as to whether it is a comedy, farce, or tragedy, number of stage settings, number of male and female characters, and the grade of satisfaction which the play gave the community. This list of plays is followed by the list of publishers with addresses and also a list of costume houses.

OGLEBAY, KATE. *Plays for children. A selected list.* New York: H. W. Wilson. Company, 1920.
This is a list of plays suitable for children from six to sixteen years of age. This list also contains lists of reference books, books about costumes and scenery, books of stories and programs for story-telling, story-playing, readings and recitations, dramatic readers, plays, books of plays, plays for Christmas, and plays for other holidays.

MARGARET DOHERTY

Bureau of Educational Research,
University of Illinois

THE SELECTION OF TEXTBOOKS

I. GENERAL REFERENCES

Baker, George M. "Texts on textbooks," *American School Board Journal*, 59:48–50, August, 1919.

Cast, G. C. "Selecting textbooks," *Elementary School Journal*, 19:468–72, February, 1919.

Dewey, Henry B. "Adoption and purchase of textbooks," *American School Board Journal*, 60:39–40, 119, March, 1920.

Doughton, Isaac. "Choosing textbooks," *American School Board Journal*, 55:29–30, November, 1917.
Mr. Doughton, superintendent of schools at Phoenixville, Pennsylvania, discusses the plan which is followed in their system.

Hall-Quest, Alfred L. *The textbook. How to use and judge it.* New York: Macmillan Company, 1918. 265 pp.
Chapter IV discusses the selection and judgment of textbooks. A score card is reproduced.

Herzberg, M. J. "Ten rules in choice of textbooks," *American School Board Journal*, 54:26, 42, March, 1917.

Judd, Charles H. "Analyzing textbooks," *Elementary School Journal*, 19:143–54, October, 1918.

Maxwell, C. R. "Selecting textbooks," *School and Society*, 9:44–52, January 11, 1919.

Mead, Cyrus D. "The best method of selecting textbooks," *Educational Administration and Supervision*, 4:61–69, February, 1918.
This is a discussion of the Cincinnati plan of selecting textbooks. It also gives the points to be considered in judging texts in arithmetic, reading, spelling, physiology, geography, and language.

"School books and eyesight," *School and Society*, 3:608, April 22, 1916.
A report of the committee of the British Association for the Advancement of Science on the type of the gloss of paper most suitable for textbooks.

"School books that ruin eyesight," *Literary Digest*, 46:394, February 22, 1913.
This earlier report of the committee of the British Association for the Advancement of Science concerns the size of type suitable for children of various ages. Specimens of each size of type are reproduced in the *Literary Digest*.

Taber, C. W. "The publisher's point of view concerning the method of selecting textbooks," *American School Board Journal*, 61:29–31, 99–100, September, 1920.

II. By Subjects

A. Arithmetic

Hall-Quest, Alfred L. *The textbook. How to use and judge it.* New York: Macmillan Co., 1918. pp. 92 ff.

Mead, Cyrus D. "The best method of selecting textbooks," *Educational Administration and Supervision*, 4:61–69, February, 1918.
See especially p. 64.

B. Civics

Smith, C. Mabel. *A study of the content of civics textbooks.* University of Illinois, Urbana, Illinois, 1918. (Master's thesis.)

C. Domestic Science

Hanna, A. K. "Standard for high school textbooks in home economics," *Journal of Home Economics*, 8:349–52, July, 1916.

Trilling, Mabel B. *Home economics in American schools.* (Supplementary Educational Monographs, v. 2, no. 6, October, 1920), pp. 28–52.

D. Economics

Robinson, L. N. "Textbooks in economics," *School and Society*, 4:990–93, December 30, 1916.

E. Geography

Mead, Cyrus D. "The best method of selecting textbooks." *Educational Administration and Supervision*, 4:61–69, February, 1918.
See pages 68–69.

Wang, Tang Chuen. An analytical study of elementary geography textbooks in America. University of Chicago, Chicago, 1918. (Master's thesis.)

F. History

Bagley, W. C. and Rugg, H. O. *The content of American history as taught in the seventh and eighth grades. An analysis of typical school textbooks.* (University of Illinois School of Education Bulletin No. 16.)

G. Manual Training

Laughlin, A. P. "Textbooks: Why use them? What kind?" *Manual Training*, 18: 187–88, January, 1917.

H. Mathematics

Arnold, Homer L. *An analysis of textbooks in plane geometry.* University of Chicago, Chicago, Illinois, 1917. (Master's thesis.)

I. Reading

Horn, Ernest. "Selection of Silent Reading Textbooks," *Journal of Educational Research*, 2:615–19, October, 1920.

Whitney, Frederick L. "Measuring the value of first-grade readers," *American School Board Journal*, 53:24, September, 1916.

Woody, Clifford. "The overlapping in the content of fifteen second readers," *Journal of Educational Research*, 2:465–474, June, 1920.

Mead, Cyrus D. "The best method of selecting textbooks," *Educational Administration and Supervision*, 4:61–69, February, 1918.
See especially p. 67.

J. Science

Downing, E. R. "Zoology textbooks for secondary schools," *School Review*, 24:375–85, May, 1916.

Frank, O. D. "Data on textbooks on the biological sciences used in the middle west, *School Science and Mathematics*, 16:218–19, 354–57, March-April, 1916.

Mead, Cyrus D. "The best method of selecting textbooks," *Educational Administration and Supervision*, 4:61–69, February, 1918.
On page 68 the points to be considered in judging texts in physiology are stated.

K. Spelling

"Current tendencies in the construction of spelling-books for elementary schools," *Elementary School Journal*, 18:464–69, February, 1918.

Woody, Clifford. "Application of scientific method in evaluating the subject matter of spellers," *Journal of Educational Research*, 1:119–28, February, 1920.

Mead, Cyrus D. "The best method of selecting textbooks," *Educational Administration and Supervision*, 4:61–69, February, 1918.
For spelling see page 68.

III. Score Cards

Hall-Quest, Alfred L. *The textbook. How to use and judge it.* New York: Macmillan, 1918.
On page 96 a score card is reproduced. This score card was originally devised by Mr. L. L. Forsythe to be used in connection with arithmetic texts; it is also adaptable for texts in the other subjects.

Stoops, R. O. "The use of score cards for judging textbooks," *Illinois State Teachers' Association. Journal of Proceedings*, 1917, p. 114–19; also in *American School Board Journal*, 56:21–22, March, 1918.
Mr. Stoops has devised a score card for reading, language, and spelling textbooks.

Ginn and Company (15 Ashburton Place, Boston, Massachusetts) has published an "Arithmetic Score Card."

The Chicago Board of Education has worked out a score card for geography, language and other subjects.

Margaret Doherty

Bureau of Educational Research,
University of Illinois

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Walter S. Monroe, University of Illinois, Urbana, Illinois.

Objectives in Reading

Assistant Superintendent Joseph P. O'Hern of Rochester has been directing the work of a committee of principals and teachers in an effort to agree upon the different aims to be met in the teaching of reading. The result of the efforts of this committee has been the formulation of a chart entitled "Attainments in Reading." This chart gives for the kindergarten and each of the first six grades, specific objectives together with suggestions for attaining them. A copy of the chart has been furnished each teacher throughout the city of Rochester; and the chart is displayed on the walls of each classroom. Superintendent O'Hern has a few extra copies which he is distributing as long as they last. He is soliciting criticisms from teachers and school officials with a view to revising the chart next year.

Reading Tests at Denver

Monroe's Standardized Silent Reading Test, Form 1, was given to 17,400 Denver school children on October 29, 1919. Form 2 of the same tests was given on May 27, 1920. A report prepared by Mrs. Emma M. Brown, Director of Measurements and Standards, covering the two applications of these tests, has been received. In it the following comments are made:

"The improvement is most satisfactory and great credit is due to both principals and teachers for the very effective work which has been done. The city medians for speed in all grades have been brought above the standard although much more can be accomplished in the lower grades by the application of newer methods. The medians for comprehension are above the standards for all grades with the exception of the fourth and fifth and even here much improvement has been made since September.

"There is still wide divergence between the performance of the different schools. In grade IIIB the school with the best record has made a median score of 12.7 while the grade with the poorest score has made a median of 3. This difference is true for all grades. In many schools there has been a marked improvement in the regularity of progression from grade to grade; but in some, however, we still find the sixth grade doing better work than the seventh, or the third grade doing better work than the fourth."

"Can We Lift Ohio 22 Notches?"[1]

In the September 1920 issue of the JOURNAL OF EDUCATIONAL RESEARCH, Dr. Walter S. Monroe presents a report of educational research in cities of over 10,000. In a table Dr. Monroe gives the number of cities in each state (except Delaware, Nevada, North Dakota and Tennessee) making systematic use of standardized tests or other scientific methods in their school systems and also the number making irregular use of such tests and methods. The 22 cities in which members of the National Asso-

[1] This statement was prepared for distribution at the School Administrators' Conference held on October 30, 1920.

WHERE DOES OHIO STAND?

Rank A			Rank B		
Rank	State	Per-cent	Rank	State	Per-cent
1	Wyoming	80	1	Wyoming	80
2	Nebraska	60	2	Nebraska	60
3	Minnesota	46	3	California	57
4	Kansas	45	4	Arkansas	56
5	Colorado	44	5	Colorado	56
6	Washington	42	6	Oklahoma	56
7	Arkansas	33	7	Minnesota	54
8	New Mexico	33	8	Oregon	50
9	Oklahoma	33	9	Wisconsin	48
10	Wisconsin	33	10	Kansas	45
11	Michigan	31	11	Louisiana	43
12	California	30	12	Montana	43
13	Kentucky	30	13	New Jersey	43
14	Missouri	30	14	Washington	42
15	New Jersey	30	15	Kentucky	40
16	Virginia	30	16	Michigan	40
17	Idaho	29	17	Mississippi	40
18	Illinois	29	18	New Hampshire	38
19	Louisiana	29	19	Illinois	34
20	Mississippi	29	20	Pennsylvania	34
21	Montana	29	21	New Mexico	33
22	Pennsylvania	29	22	Ohio	33
23	Ohio	25	23	West Virginia	33
24	Oregon	25	24	Virginia	30
25	Vermont	25	25	Idaho	29
26	Iowa	20	26	Mississippi	29
27	Connecticut	17	27	Connecticut	27
28	Indiana	17	28	Massachussetts	27
29	New York	15	29	Indiana	26
30	Florida	14	30	Vermont	25
31	New Hampshire	13	31	New York	23
32	Massachusetts	11	32	Iowa	20
33	West Virginia	11	33	South Dakota	20
34	Maine	10	34	Texas	19
35	North Carolina	08	35	South Carolina	17
36	Texas	04	36	Florida	14
37	Alabama	00	37	Alabama	13
38	Arizona	00	38	Rhode Island	11
39	Dist. of Columbia	00	39	Maine	10
40	Georgia	00	40	North Carolina	08
41	Maryland	00	41	Georgia	05
42	Rhode Island	00	42	Arizona	00
43	South Carolina	00	43	Dist. of Columbia	00
44	South Dakota	00	44	Maryland	00
45	Utah	00	45	Utah	00

Director, Extension Department,
Ohio University, Athens, Ohio

R. L. MORTON

ciation of Directors of Educational Research are in charge of this type of work were not included.

We have drawn upon Dr. Monroe's table for the data involved in the rankings on the accompanying sheet. In making our calculations we have assumed that the 22 cities referred to make systematic use of such tests and have included them. We have also assumed that all cities making use of tests replied to Dr. Monroe's letter—a doubtful assumption. A total of 253 cities are involved.

Rank A gives the percent of cities in each state making systematic use of tests. Rank B gives the percent making any use of the tests, systematic or irregular. Thus 25 percent of the cities of over 10,000 in Ohio (12) make systematic use of tests and 33 percent (16) make some use of them, four of the 16 using them irregularly.

Ohio occupies a median position in each column.

The rankings reveal very clearly the progressive tendency of the west and the conservatism of the east and south.

The Normal Distribution of School Marks

School administrators quite generally recognize that the marks assigned to pupils should, under average conditions, distribute themselves in close conformity to the normal surface of frequency. Practices differ as regards the number of intervals into which marks are distributed and also as regards the percent which it is thought desirable to have in each interval. A distribution of marks into five intervals, A, B, C, D, and E, is frequently found. This plan has the advantage of using as its unit-basis a commonly employed measure of variability, the *standard deviation*. Under normal, average conditions with a large number of pupils approximately 7 percent should be very superior or A's, 24 percent superior or B's, 38 percent average or C's, 24 percent inferior or D's, and 7 percent very inferior or E's.

The writer has found it necessary in making comparative studies of distributions of school marks to employ a formula that will make possible a close comparison of the normality of two or more distributions.

Let us illustrate with the marks contained in the accompanying table:

Interval	Number	Percent	Normal	Deviation	Error
A	23	15.9	7	+8.9	9.6
B	50	34.5	24	+10.5	13.8
C	44	30.3	38	−7.7	20.3
D	18	12.4	24	−11.6	48.3
E	10	6.9	7	−0.1	1.4
Total	145	100.0	100	.....	93.4

Of the 145 marks assigned, 23 (15.9 percent) are A's, 50 (34.5 percent) are B's, etc. Comparing these percents with the normal in the adjacent column we find that there is an excess of 8.9 percent in the A interval and of 10.5 percent in the B interval. But in the C, D, and E intervals there is a deficit so we have placed minus signs before the deviations for these intervals.

Now the magnitude of the error in any interval is judged by comparing the actual deviation with the greatest possible deviation *in the direction in which the deviation is made*. In the A interval, for example, obviously the greatest possible positive deviation occurs when all the marks are A's. In such an extreme case the deviation would be +93. Then the A error is determined by comparing 8.9 with 93. But 8.9 is 9.6 percent of 93. In like manner we find the B deviation, 10.5, to be 13.8 percent of 76, the greatest possible deviation in the direction in which the deviation occurs. The C deviation, however, is a negative deviation. The quantity 7.7 is 20.3 percent of 38, the greatest possible deviation in the direction in which the deviation occurs. In this case the greatest possible deviation is realized when no one in the class or school is assigned this mark. The errors in the D and E intervals are computed in exactly the same way as was that in the C interval. The quantity 11.6 is 48.3 percent of 24 and the quantity 0.1 is 1.4 percent of 7.

The error of the distribution then may be expressed by the following formula:

$$E = \frac{\Sigma e}{n} = \frac{93.4}{5} = 18.7.$$

The coefficient of accuracy,

$$A = 100 - E = 100 - 18.7 = 81.3.$$

Of course this method may be applied to a system of rating which distinguishes any number of marks—e.g., a three-point or a seven-point system. The normal distribution of marks for such a system must first be determined from a table showing the fractional parts of the area under the normal probability curve. For a three-point system this distribution in terms of percent of marks would be 16, 68, 16; for a seven-point system, 2, 8, 23.5, 33, 23.5, 8, 2.

Director, Extension Department, R. L. MORTON
Ohio University, Athens, Ohio

Barr's Diagnostic Tests in American History

The Barr Diagnostic Tests in American History, Series 2A and 2B, have recently been published by the Bureau of Educational Research.[1] These tests represent a new attack upon the problems of measuring ability in the field of history.

There are five tests: (1) comprehension, (2) chronological judgment, (3) historical evidence, (4) evaluation of facts, and (5) causal relationships. When the history pupil is confronted with the printed page he must first read and understand the material placed before him. History is a reading subject, but differs from general reading in that it employs historical background and a technical language. Then, secondly, the really "historically minded" person asks: "Are the facts here stated true?" Pupils frequently pass over this step with a vague general feeling that all printed facts are true. The third inquiry is: "Is the fact important?" Even the most immature pupil will make some selection. Few choose to memorize the text verbatim. The fourth step is to place the facts in time order. The facts of history are peculiar in that they are all placed in a definite time relationship. When taken out of this time relationship they lose their historical significance. And finally the facts of history must be studied in their relation to other facts. The facts of history are not isolated facts, but rather trains of facts tied in causal relations. Five tests are given—each to measure one of these five fundamental processes.

[1] A copy of these can be obtained from the Public School Publishing Company, Bloomington, Illinois, who are distributing them under the auspices of the Bureau of Educational Research, University of Illinois, Urbana, Illinois.

While the information factors have not been entirely eliminated, the tests deal, in the main, with general historical information rather than with specific facts. Although the tests deal with abilities rather than specific facts they are not designed to measure native historical ability or general intelligence but include school training, home training, and previous experience—the sum total of abilities—in so far as these abilities bear upon the ability to do these particular exercises. While the tests may be used to measure achievement in history, they aim primarily to aid the teacher in giving more intelligent classroom instruction by diagnosing the particular need of the individual pupil.

The tests have been three times revised, but not standardized. It is hoped that more definite weightings of the different questions can be supplied in the near future.

While measurement of content is not directly aimed at in these tests, the content is, however, based upon the available studies on the content in American history including Bagley and Rugg. In the main only the larger and more important facts in American history have been included.

Illinois Standardized Algebra Test

With the great increase in the number and extent of educational and intelligence tests, school administrators and teachers are confronted with a real problem. This is to find the time to give the tests. A school day, already too short, must either be lengthened or some part of the regular work must be set aside. A second, though perhaps minor difficulty, is the expense involved in the purchase of tests. Many school authorities, at present facing a financial crisis, are compelled to practice the severest of economy. It therefore seems that the devisers of tests should give consideration to these factors.

At present, algebra seems to be a field which affords an opportunity for a test relatively inexpensive and requiring but a short time to administer. The Bureau of Educational Research of the University of Illinois has recently made available such a test.[1] It was devised by Professor W. S. Monroe and Mr. Lewis W. Williams. It is based upon the simple equation since the simple equation, the processes it involves and the processes involving it, constitute a *very* large part of the work of the first year in algebra.

The test consists of four parts, each of which contains twenty exercises. In part one, the two unknown quantities are in the first member of the equation; in parts two, three, and four, there is one unknown in each member. Part three differs from part two in that it involves the parenthesis. In part four, the fractional form is found in both members of the equation. The test can easily be given within a single class period. Four minutes are allowed for part one, five for part two, nine for part three, and ten for part four. This permits twelve minutes out of a forty-minute period to be devoted to directions, passing and collecting papers, and the usual interruptions.

The cycle arrangement is used in each part, each of which consists of five cycles of four members each. These members differ from each other in the arrangement of

[1] Copies of this test may be secured from the Public School Publishing Company, Bloomington, Illinois, which is distributing them under the auspices of the Bureau of Educational Research of the University of Illinois.

the signs. The following arrangement is carried out: $+-+-$, $-++-$, $++--$, and $+--+$. The general plan may be illustrated as follows:—

$$\text{Part I: } \pm ax \pm bx = \pm c \pm d$$
$$\text{Part II: } \pm ax \pm c = \pm bx \pm d$$
$$\text{Part III: } \pm k(\pm ax \pm c) = \pm bx \pm d$$
$$\text{Part IV: } \frac{\pm ax \pm c}{n_1} = \frac{\pm bx \pm d}{n_2}$$

From inspection it is evident that there are many combinations of signs which might be used, particularly in parts three and four. The above plan was arbitrarily chosen. Variations are produced by changing the relative size of the numerical coefficients of the unknowns as regards the knowns. The cycle arrangement, accurately carried out, may produce results showing diagnostic properties inherent in the test. Evidence of this appeared quite clearly in preliminary trials. For example, if some member of a cycle really represents a distinct type of problem, a pupil missing it in the first cycle would be apt to miss the corresponding member in at least a majority of the other cycles. If after the test has been submitted to a large number of pupils, results show this tendency holds throughout the test, much assistance will be given to the teacher. In any event, the test has general properties which seem to justify its appearance.

The Illinois Standardized Algebra Test, as it is called, has recently been placed in the hands of teachers to be given to six hundred pupils. As soon as results are available, tendency standards will be issued. Standards will be set up for pupils who have had one semester of work in algebra, as well as for those who have had two and three, respectively.

University of Illinois LEWIS W. WILLIAMS

Use of a First-Grade Intelligence Test in Detroit

The following quotation is taken from the Detroit Educational Bulletin for November 1920. It is reprinted here partly because of the general interest in intelligence tests and partly because it illustrates a well thought-out method of making use of the results of these tests.

"Under the direction of the Psychological Clinic, more than ten thousand B I pupils were given a group intelligence examination during September 1920. The examination was given by sixty special class teachers, assisted by members of the Psychological Clinic. The test used is known as the Detroit First Grade Intelligence Test, which was devised by the Psychological Clinic during the past school year. The ten thousand pupils examined were classified approximately as follows: the 8% receiving the highest score were given an intelligence rating of A; the next 12%, B; the next 18%, C+; the next 24%, C; the next 18%, C−; the next 12%, D; and the last 8%, E. In other words, 20% of the children tested were given A or B ratings, 60%, C+, C, or C− ratings, and 20%, D or E ratings. In this examination, less than one-half of one per cent of the pupils tested made a zero score and no pupil made a perfect score. It is interesting to note the extent to which different schools vary in respect to the ability of B I pupils. In several schools there were no pupils who received a grade of E or D, while in certain other schools there were no pupils receiving B or A grades.

"A letter from the Superintendent of Schools was sent to the principal of each school along with the intelligence ratings of the B I pupils. The letter from the Super-

intendent recommends that the intelligence ratings be used in one or more of the following ways:

"1. Arrange the pupils in three groups, the groups to be known as Groups X, Y and Z; Group X to consist only of pupils with an intelligence rating of A or B; Group Y to consist only of pupils with an intelligence rating of C+, C or C−; and Group Z to consist only of pupils with an intelligence rating of D or E. By this method, X, Y and Z will always designate pupils of about the same grade of ability regardless of the school in which they might be found. If for any reason, you do not find it advisable to follow the grouping suggested, you should designate the groups that you may form by symbols other than X, Y or Z. The X, Y and Z groups in the B First are to be designated as I B-X, I B-Y and I B-Z. The assignment by letter ratings of pupils to Groups X, Y and Z is to be considered tentative. You have the authority to transfer a pupil from one group to another as soon as you are convinced that the pupil is not properly classified, provided you keep a record of the number of and the reasons for such transfers, in order that the Clinic may have definite information as to the accuracy of its classification. The Psychological Clinic stands ready to assist you in the more accurate classification of the apparent misfits by individual examination.

"The pupils who are found to be able to do more work than is required of the group to which they belong are to be transferred to the next higher group, those who cannot do the work of the group to which they belong will be transferred to the next lower group, and those who cannot keep up with the lowest group, or Group Z, will be considered candidates for the special classes and will be given an individual examination by the Psychological Clinic. It is suggested in this connection that the unassigned or coaching teachers could be of marked assistance in helping classify the apparent misfits.

"The principals who adopt this method of classification are encouraged, under the direction of the Department of Educational Research, to work out courses of study for the X and Z groups, an enriched course of study for the X Group, and a course in minimum essentials for the Z Group. In schools where there are not enough A and B or D and E pupils for a single room, it is suggested that two groups be placed in the same room, or that like groups from adjacent schools be put together.

"2. In schools where all the pupils, because of congested conditions, cannot attend full time, the intelligence ratings can be used to select the pupils that stand most in need of full time instruction. It is believed that the pupils with an intelligence rating of A, B and C+ might be so grouped and the course of study so organized that they would actually accomplish more during a half-day session than they are now able to accomplish during a full day session in the schools where the congestion is the greatest.

"3. In small schools where there are only a few cases of pupils securing an A or B rating, these pupils might be given special help by the unassigned teacher in order that they may pass quickly into the A first grade. This method was used to advantage in one or two of the schools last year where the first grade children were classified by means of intelligence tests. In the schools where there are only a few pupils who receive a D or E rating, the unassigned teacher could to advantage give these pupils special attention in order that the special class cases might receive an individual psychological examination as soon as possible."

National Association of Directors of Educational Research

(E. J. Ashbaugh, *Secretary and Editor*)

Do You Know

That Standardized Tests are most valuable for Diagnostic Purposes?

A good physician always diagnoses each important case before giving advice and repeats certain parts of his diagnosis from time to time to determine the progress of the case.

In like manner, a good teacher at the beginning of the year diagnoses each pupil sent her and repeats certain parts of her diagnosis from time to time to determine progress.

The physician has far more accurate instruments and tests for diagnosis than he had a few decades ago. Hence, his data are now more accurate, his advice more valuable, and his success greater. So in the realm of teaching, improved instruments for diagnosis have been devised. The last decade has seen the development of the standardized tests of pupil achievement. These tests are superior for diagnostic purposes to the tests, measures, and examinations devised by the teacher, principal or other school officials. Their superiority depends chiefly upon two factors:

1. The standardized tests are more objective. Hence, the results are fairer and more impersonal.

2. They are standardized by grades. Hence, by the application of these tests and the comparison of the results with the grade norms or standards, the teacher may know whether each pupil whom she receives is, in general, up to standard for his grade when she receives him; she may also know in which subjects each pupil is below, and in which subjects above, standard. Good teaching begins with what the child Knows and Is. Hence, the need for accurate diagnosis.

During the year 1918–1919 many teachers in the Kansas City schools used standardized tests for diagnostic purposes with most excellent results. This use of the tests has been so helpful that the Bureau of Research and Efficiency is planning to make itself this year purely a *Service Bureau*. This service aims to accomplish the following things:

1. To supply any teacher or principal with any tests he may need in his school work.

2. To assist both teachers and principals in selecting and giving tests and in tabulating and interpreting results.

3. To cooperate in improving the organization of the school, the classification of pupils, and the methods of teaching so as to secure better service for the pupils.

4. To confer with teachers and principals on any problems, especially problems of school instruction, grade objectives or standards, and school achievement.

The bureau is your servant and exists solely to assist you in giving the children the best possible service. Call upon the bureau for any service it can render.

(The above is a part of a circular letter sent in September 1919 to all teachers and principals in the Kansas City schools. It is one of the various instruments used by Mr. Melcher and his assistants in getting the bureau of which he is head to function through the regular school organization and render service to the children of the city. That the program was worth while and reached at least some of its objectives may be inferred from the following from his most recent letter: "During the year 1920–21, it is planned to use the same method that was used during 1919–20." The secretary would welcome copies of circular letters, bulletins, reports, etc., which the members send to their principals and teachers, together with any comment which may explain the use or results from the same.—SECRETARY.)

Detroit.—Homer W. Anderson, Assistant Director of Educational Research, reports the following interesting activities of his department:

1. Have standardized and given a typewriting test in all high schools of the city. Tentative standards are now available.
2. Developing a series of tests in chemistry.
3. Committee of mathematics teachers are at work on evaluation of present algebra tests with a view to using the most satisfactory or to developing a new set.
4. Committees of high-school teachers under the direction of the department of research are carrying on investigations in foreign languages, science, and social science.
5. Department is cooperating in the formulation of building program for the city.

Oakland.—Virgil E. Dickson, our vice-president, says that his bureau is "continuing the policy of former years in making strong emphasis on studying the capacities of children. We believe that standard mental tests and standard pedagogical tests must go hand in hand in studying the educational problems that confront us."

They will soon complete the mental testing, either group or individual, of every child in the school system. Comparison of achievement or pedagogical tests and I. Q. with instructional time is expected to give a better check on quality of teaching than was before possible.

They find it thoroughly possible in practical administration to have classes for superior, normal, and retarded groups and have several committees at work on courses of study for different subjects which shall be adjusted to this "three-track" plan.

Beaumont, Texas.—Miss Clara Mallory reports that they too are working on reclassification through the use of mental tests. At the opening of the present school year, the Otis test was given to over two hundred high-school freshmen and classification was made on the basis of the test. Mental ages of eight to eighteen were found in the group.

The graduating class from the eighth grade will be given the Otis test this coming spring in order that classification may be ready when school opens in the fall.

Haggerty Achievement Examination in Reading, Sigma 1, was given for classification purposes to children in grades II and III.

Pedagogical tests will be given at the beginning of the second and fourth quarters and results recorded on individual rating cards as last year.

Kansas City, Missouri.—George Melcher, director of the bureau, has been the president of the Missouri State Teachers' Association during the past year. The association has an enrollment of fifteen thousand; and the recent meeting had an attendance of six thousand. This has taken much of the president's time since an extensive publicity campaign for increasing teachers' salaries and revenue for schools has been carried on.

Here also group intelligence tests have been used for reclassification of pupils. About five thousand children have been tested and in one high school the freshmen have been divided into three groups, superior, average and inferior. The teachers know the rating of the classes they teach but in most cases the children do not. The same principle is being followed in one large elementary school.

For the first time, this fall the bureau is testing kindergarten and first-grade children by means of the Stanford Revision of Binet and adjusting classes in accordance with the findings. The teachers are well pleased with the results.

A general survey will be made this year of the whole system in two or three subjects, probably geography, language, and reading.

Cleveland.—W. W. Theisen, the new director, says that he "hesitates to say much about what we are doing as we are just getting started." However, he does tell a few things.

1. Testing entering first grade pupils in forty schools with Pressey Primer Scale.
2. Planning to test all graduating high-school seniors and incoming junior high-school pupils with group intelligence tests.
3. November 2 the electors of Cleveland indorsed a fifteen million dollar bond issue and a special five-year three-mill tax levy for general purposes. This was not particularly the work of the bureau but indicates the faith the public has in its schools.
4. Personally, Dr. Theisen is finishing his study for the *Yearbook* on "Factors Affecting Results in Primary Reading."

Iowa City, Iowa.—H. A. Greene and E. J. Ashbaugh of the University of Iowa Bureau of Educational Service have been unusually busy this fall with calls for definite service in the field. Dr. Greene conducted an intensive survey of the English and mathematics situation in the eighth grade and high school in Marshalltown and is now engaged in assisting the city of Keokuk in putting over a high-school building program.

Dr. Ashbaugh has continued his work for the Atlantic school board, has conducted an instructional survey at Forest City, and has received several calls for service with county superintendents. These calls have been in connection with the use of standardized tests in rural survey and supervision.

Dr. Ashbaugh is state chairman of the N. E. A. committee appointed to study relative efficiency of one room rural schools and consolidated schools. Other of our members doubtless hold the same position for their state.

We are glad to welcome two more new members to our association. They are:

Dr. Bird T. Baldwin, Director of the Child Welfare Research Station, Iowa State University, Iowa City, Ia.

Mr. H. D. Rinsland, Director of Bureau of Research and Guidance, Ardmore, Oklahoma.